Behavioral Biases and Choices of Capital Structure: A Sample from Portugal

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Abstract

Financial literature has for many years focused on firm- and industry-level characteristics to help explain company decision-making, however, theorists have long acknowledged a gap between theoretical models and empirical data. Behavioral finance has more recently emerged as to study the role of managerial heterogeneity in corporate decisions, but there is still no extensive research. This dissertation aims to understand whether executives' behavioral biases – optimism, risk and loss aversion, and present and confirmation biases – produce an effect on capital structure decisions, represented by the debt and short-term debt ratios, at firms in Portugal. Through a survey-based research and following a similar methodological approach to Graham and collaborators (2013), I was able to infer executives' biases and collect company data for the year 2020. Results showed that Portuguese executives are biased, being moderately optimistic, highly risk- and loss-averse, and suffering from confirmation bias and a minor present bias. Additionally, I confirmed that optimistic and loss-averse managers incur in higher debt levels while risk-averse executives seek out lower levels of debt. Nonetheless, these biases did not produce an effect on debt maturity preferences, suggesting that firm specificities and the global panorama continue to be the most important explanatory variables. This dissertation therefore concludes that behavioral biases, mainly optimism, risk aversion and loss aversion, produce an effect on Portuguese firms' choices of debt levels, and should be taken into consideration by decision makers.

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Resumo

A literatura financeira tem-se focado nas características das empresas e das indústrias para explicar as decisões das firmas, contudo, os teóricos reconhecem que há uma diferença entre os modelos teoréticos e o que se verifica empiricamente. As finanças comportamentais emergiram recentemente com o intuito de estudar o papel da heterogeneidade dos gestores em decisões corporativas, mas ainda não existe muita investigação. Esta dissertação tem o intuito de analisar se os enviesamentos comportamentais dos executivos – otimismo, aversão ao risco e à perda e enviesamentos confirmatórios e do presente – produzem um efeito em decisões de estrutura de capital, representadas pelos rácios de endividamento e endividamento de curto-prazo, das empresas portuguesas. Através de um questionário e seguindo um método similar ao de Graham e colaboradores (2013), foi possível inferir enviesamentos dos executivos e colecionar dados das empresas para 2020. Os resultados mostram que os executivos portugueses são moderadamente otimistas, avessos ao risco e à perda, e sofrem de enviesamento de confirmação e de um ligeiro enviesamento do presente. Adicionalmente, executivos otimistas e avessos à perda incorrem em mais dívida, enquanto os gestores avessos ao risco optam por menos dívida. Contudo, estes enviesamentos não produziram qualquer efeito na maturidade da dívida, sugerindo que características das empresas e o panorama global continuam a ser as variáveis de análise mais importantes. É possível concluir que otimismo e aversão ao risco e à perda produzem um efeito nas escolhas de endividamento das empresas portuguesas, e por isso devem ser tidos em conta pelos decisores.

Título: Enviesamentos Comportamentais e Escolhas de Estrutura de Capital: uma Análise em Portugal

Autora: Mafalda Amorim Teixeira

Palavras-chave: Finanças Comportamentais; Estrutura de Capital; Enviesamentos Comportamentais; Portugal; Regressão Linear;

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1. Introduction

What factors should be considered when analyzing corporate decisions on capital structure? At first glance, one might assume this is an easy question to answer, given that corporate governance is a topic that raises interest by many and has extensive research surrounding it. In fact, for many years, theories have been developed focusing on "firm-, industry-, or market-level characteristics to explain corporate behavior and performance" (Bertrand & Schoar, 2003, p.1170), which are still studied today. These traditional financial theories include the trade-off theory (Miller, 1977), the pecking order theory (Myers, 1984) and the agency theory (Jensen & Meckling, 1976), all of which focus on determinants of capital structure.

But these models evolve around the idea that decisions made by managers are rational, leaving all possible determinants of corporate decisions to external factors. However, this is not the case in every scenario. Of a few studies conducted on decisions over capital structure (Bradley et al., 1984; Smith & Watts, 1992; Titman & Wessels, 1988), there are still a few conditions left unexplained, even when controlling for all firm and industry characteristics. This served as a limitation at the time and created doubt on whether these models indeed captured all relevant aspects of corporate behavior. So why are we not considering the "possible role that individual managers may play in shaping these outcomes" (Bertrand & Schoar, 2003, p.1170)?

In the last couple of decades, behavioral finance emerged as a new field of finance that studies the idea that "individual heterogeneity matters in corporate finance/governance" (Graham et al., 2013, p. 103). Much like in psychology and sociology, behavioral finance defends that "psychological phenomena prevent decision makers from acting in a rational manner" (Shefrin, 2001, p. 113), and that this irrationality is often associated with overestimating or underestimating when making a corporate decision (Ting et al., 2016). Analyses on decision-making processes have consistently shown that individuals do make use of behavioral biases that lead them to an inaccurate perception of their own abilities (Costa et al., 2017).

Concerns for these effects are rising, as recent papers suggest that managers play a big role on corporate actions. Findings show that managerial fixed effects are determinants of a range of corporate variables (Bertrand & Schoar, 2003), that managerial optimism is typically associated with an underinvestment-overinvestment tradeoff when it comes to free cash flows, (Heaton, 2002), and that management's risk-averse characteristics may be a key determinant of capital structure (Barton & Gordon, 1988). Studies also show that confirmation bias may

overemphasize managers' beliefs leading them to underestimate important information opposite to their position (Costa et al., 2017), and that those with present bias tend to overestimate the discounting of gains, exhibiting a preference for current rewards (Hardisty et al., 2013).

Even though behavioral finance is a field that is being increasingly researched, studies are still surface level. Graham and collaborators (2013) is one of the first papers to actually analyze the relationship between managerial attitudes and corporate actions, using a set of firms from the US, focusing on the impact of US CEOs' behavioral biases on firms' capital structure and mergers & acquisitions. But there is still no broader research on the impact of psychological phenomena on company decisions for other countries. As the Portuguese institutional context, the country's macroeconomic conditions, and the people's cultural identity and organizational preferences are very different from those of the US, the analysis conducted by Graham and collaborators (2013) cannot be used by Portuguese firms to predict their executives' behavior. Therefore, I began to wonder: What behavioral biases do Portuguese executives actually exhibit, if any? And if they do, what is their impact on corporate decisions, particularly in capital structure? This is what this dissertation intends to answer.

1.1. Problem Statement

To understand the impact of behavioral forces on corporate decisions in a sample from Portugal, I used a survey-based approach to provide new insights into the people and processes behind capital structure decisions. By using this method it is possible to infer certain characteristics that traditional empirical work based on large archival data sources cannot (Graham et al., 2013). I inferred behavioral phenomena, namely risk and loss aversion tendencies, levels of optimism, and confirmation and present biases through tests and gambles used in the field of psychology to study human behavior. All information was quantified to be further analyzed. Simultaneously, I collected information on demographics and company characteristics through direct questions, which I used as control variables in the analysis to better predict the relationship between behavioral biases and capital structure decisions. Following traditional financial literature (e.g., Miller, 1977), the later are expressed through a firm's debt level and maturity. Therefore, this research tries to answer the question: "How do behavioral biases influence Portuguese executives in their choices of firm capital structure?". This problem statement can be divided into three main research questions:

RQ1: How are Portuguese executives influenced by behavioral biases and how does that compare to US executives?

RQ2: Is there a relationship between behavioral biases and decisions on firm debt levels?

RQ3: Is there a relationship between behavioral biases and executives' preference on debt maturity?

When it comes to Portuguese executives' specifications and comparison to US managers, Hofstede (1980) serves as a good foundation to compare both cultures and their organizational preferences. For the relationship between biases and corporate finance, as far as I am aware of, there are no other studies besides Graham and collaborators (2013) that analyze this directly. Thus, their paper will serve as a foundation for this dissertation, complemented by vast research in psychology around behavioral biases (e.g., Kassin et al., 2013; Nickerson, 1998) and conceptual theories in finance (e.g., Hackbarth, 2008; Heaton, 2002) that discuss potential implications of managers' personal characteristics in corporate decisions.

This analysis provides new insights and contributions to this still underdeveloped field of finance. Firstly, this is one of few studies that uses psychometric tests and gambles to study executives' behavior and is the first ever to apply this method directly to a Portuguese sample. Additionally, it contributes to recent literature that investigates whether executives' behavioral phenomena relate to corporate decisions by adding the study of confirmation bias. Also, the analysis includes various adaptations to Graham and collaborators' (2013) study, to make it more suitable to the Portuguese sample, as their study targeted US executives. Overall, this paper aims to give the reader a good overview of the typical behavioral biases of Portuguese executives and evaluates whether they have a relationship with capital structure choices.

The rest of the paper is organized as follows. Chapter 2 presents a more in-depth analysis of the concepts that will be explored in this research. Chapter 3 defines the sample, describes the survey instrument that was used and explains the choice of method for analyzing data. Chapter 4 shows the results, more specifically, the characteristics of the sample and the relationship between behavioral biases and capital structure decisions. Chapter 5 offers a discussion of main conclusions, implications of this dissertation, and limitations and suggestions for future research. Finally, Chapter 6 offers the reader a brief conclusion.

2. Literature Review

2.1. Capital structure decision-making

"Capital structure policy deals with the financing of firm's activities, with debt, equity and intermediate securities" (Brounen et al., 2006, p. 1410). Traditional research on capital structure is based on Modigliani and Miller's (1958) trade-off theory, which states that companies choose their levels of debt and equity through balancing the tax saving benefits of debt with its potential financial distress costs. Later on, agency theory (Jensen & Meckling, 1976) came to help explain and resolve the issues around the relationship between principals (shareholders) and their agents (managers) proposing that an optimal capital structure is obtained through trading off the agency costs of debt against incurrence benefits. Additionally, an alternative approach proposes that executives, when choosing how to finance their firm, follow a pecking order preference (Myers, 1984), meaning that they prefer to finance their company first through retained earnings, then with debt and lastly with equity financing. This theory enforces the importance of considering asymmetric information as it increases financing costs.

Overall, models that study a firm's capital structure attempt to explain the mix of securities and financing sources (internal funds, debt, or equity issuing) companies can use to finance their investment opportunities (Myers, 2001). Hence, capital structure decision-making can be represented by a firm's debt and short-term debt ratios (Graham et al., 2013), which measure the proportion of a company's assets that are financed by debt and which firm liabilities have a shorter maturity, respectively.

Throughout the years, corporate finance literature has established a clear relationship between debt dynamics and firm- and industry-level characteristics (Bertrand & Schoar, 2003). These include macro effects, such as industry classification (Titman & Wessels, 1988), and firm characteristics, for example size (Frank & Goyal, 2007), profitability (Hovakimian et al., 2001), and whether a firm is public (Brav, 2009) or family-owned (González et al., 2013). However, researchers keep on acknowledging the existence of a gap between theoretical predictions and unresolved empirical facts. Some argue that what is known about capital structure is still very little, as theories do not seem to explain financing behavior (Myers, 1984). Therefore, the question remains: which factors are reliably important (Frank & Goyal, 2009)?

2.2. Behavioral Biases

As time has passed, more studies have recognized that deviations from rational decision-making exist due to biases and heuristics, which are "decision rules, cognitive mechanisms, and

subjective opinions people use to assist in making decisions" (Busenitz & Barney, 1997, p. 12). From this trend of thought emerged a new discipline, behavioral finance, that "offers alternative explanations of what motivates economic decision-making" (Chira et al., 2008, p. 12) by studying what traditional finance does not: executives' irrationality (Chira et al., 2008).

In this dissertation, the biases researched by Graham and collaborators (2013) – optimism, risk aversion, loss aversion, present bias – were analyzed. Also, I introduced the study of confirmation bias, as it is not only considered "a manifestation of a pattern of reasoning" (Jones & Sudgen, 2001, p. 92) rather than a simple error, thus producing suboptimal decisions, but can also aggravate the effects of other behavioral phenomena (Shefrin, 2001). The remaining of this section will focus on introducing each bias.

Firstly, optimism can be defined as "positive expectations about future events" (Puri & Robinson, 2007, p. 75). This belief that someone is more likely to experience positive events and less likely to experience negative events has more impact depending on the characteristics of each situation (Weinstein, 1980). If people are committed to the outcome of an event and perceive it to be easily controllable, then they believe in a bigger likelihood for that event to turn out the way they want to. Given that executives believe they have a large control over firm performance (March & Shapira, 1987) and they normally appear to be committed to the firm's success as their income, reputation, and employability depend on it (Gilson, 1989), managers can be considered optimistic.

Risk is a vastly explored topic in the field of finance and is acknowledged as an important factor in decision-making (March & Shapira, 1987). In fact, investors' risk-averse behavior has been exhaustively studied and incorporated into frameworks to help predict the default probability of financial assets (Wu & Yu, 1996). One of the most known theories around risk, prospect theory[1] (Kahneman & Tversky, 1979), defends that people value losses and gains differently, making decisions based on perceived gains rather than on perceived losses. For instance, most individuals prefer winning 100€ with certainty rather than taking a risky bet in which they can, with the same probability, either win 200€ or nothing.

Moreover, loss aversion, an explanatory variable in the relationship between risk and uncertainty (Tversky & Kahneman, 1992), "reflects the observed behavior that agents are more sensitive to losses than to gains, resulting in a utility function that is steeper for losses than for gains" (Köbberling & Wakker, 2005, p. 120). Hence, when coming across two equal choices

[1]There are two other families of models that study risk but were outperformed by prospect theory when applied to company data – following Aikake's Information Criterion (Kliger & Levy, 2009), a prediction error estimator providing information on the quality of a statistical model.

but one presented in terms of potential gains and the other in terms of potential losses, loss-averse individuals will choose the gains. This is linked to framing effects, as variations in the framing of options (i.e., as a loss or as a gain) lead to different preferences (Tversky & Kahneman, 1986).

A time preference is defined as the "marginal rate of substitution between current and future consumption" (Becker & Mulligan, 1997, p. 731). In simpler terms, present bias represents individuals' tendency, when in a trade-off situation, to settle for a smaller present reward rather than waiting for a larger future reward (Hardisty et al., 2013). But why do people exhibit this behavior? Because they are typically impatient, like to avoid uncertainty, and seek closure (Hardisty et al., 2013). When it comes to preferences over losses, although it is a less researched topic, Hardisty and collaborators (2013) show present bias also affects people's choice between a current or a future loss. Someone who suffers from this phenomenon will tend to pay things off immediately, strongly driven by a need for closure. Thus, much like with rewards, there is a preference for dealing with losses today (Hardisty et al., 2013).

Lastly, confirmation bias is a natural and automatic feature of human cognition (Nickerson, 1998) in which "people tend to seek, perceive, interpret and create new evidence in ways that verify their preexisting beliefs" (Kassin et al., 2013, p. 44). Thus, it accentuates what individuals want to interpret as true while ignoring other potential scenarios outside of their preconceived notions (Chira et al., 2008; Doherty & Tweney, 1983). There is strong evidence for the existence of confirmation bias when acquiring information (Jones & Sudgen, 2001). For example, an economic agent who faces the same options frequently might develop a false sense that one is optimal, even if presented with rational evidence of the contrary. Although some defend that executives should be questioning whether they offer credible alternatives along with their recommendation (Kahneman et al., 2011), it is proven that decision makers tend to test options that have the best chance of verifying current beliefs instead of those that have a better chance of contradicting them (Klayman & Ha, 1987).

Additionally, there are several characteristics that have been shown to affect people's degree of behavioral biases. Those include academic/career related variables, such as education (Becker & Mulligan, 1997) or working experience (Jones & Sudgen, 2001), and demographics, like gender (Jacobsen et al., 2014), or someone's culture (Lykes & Kemmelmeier, 2014).

2.2.1. Behavioral Biases and Portuguese Executives

Cultural differences have been vastly explored in psychology literature (e.g., Lykes & Kemmelmeier, 2014; Yates & de Oliveira, 2016) and were proven to produce effects on

people's biases. In fact, Graham and collaborators (2013) gathered information on CEOs and CFOs from the US and a number of countries[2] from Europe and Asia, and were able to infer significant differences between US and non-US executives in their characteristics and biases. They concluded that US executives tend to be more optimistic, less averse to losses, more risk-tolerant and have a lower present bias than non-US counterparts. Nonetheless, Graham and collaborators' (2013) results do not directly address this dissertation's main research questions as they explored the relationship between behavioral biases and corporate actions solely for US CEOs. Moreover, they placed all non-US executives in one homogeneous group, which may have led to misleading conclusions, and provided no information on whether Portuguese executives were included in the analysis.

Based on Hofstede's model[3] (see Figure 1), one can take conclusions on the Portuguese population and apply them to Portuguese executives. Through the low scoring on indulgence, one can state that Portugal has a culture of restraint, associated with cynicism and pessimism (Hofstede, 2001). Additionally, satisfaction and optimism in Portugal are some of the lowest in the European Union, mainly due to the lack of employment expectations and financial stability (Eurofound, 2020). Still, studies show that executives tend to be more optimistic than the lay population (Graham et al., 2013).

Furthermore, Portuguese can be defined as risk- and loss-averse, given the extremely high scoring on uncertainty avoidance. This is much aligned with Portugal's history of strict societal controls, associated with lack of freedom of expression and lingering mindsets (Burton, 2015). Although executives tend to be more risk-tolerant than the lay population (Graham et al., 2013), the country's risk and loss perception is still strongly influenced by Salazar's regime, impacting both economic development and decision-making (Burton, 2015).

Lastly, Portuguese are short-term oriented, meaning they have a preference for normative rather than pragmatic thinking (Hofstede, 2001). In simpler terms, people are more traditional, honoring their convictions and ideals, and infer faster judgements on behavior/outcomes, which is associated with confirmation bias (Kassin et al., 2013). Moreover, Portuguese expect and look for quick results, exhibiting a smaller propensity for saving for the future (Hofstede, 2001). Ultimately, they care more about immediate gratification than long-term fulfilment, thus being expected to suffer from a strong present bias (Hardisty et al., 2013).

[2]The list of countries was not specified in the paper.

[3]Geert Hofstede was the first to introduce a cultural model that is nowadays universally accepted. With the contribution of other researchers, this study has evolved into a six-dimension model of national culture that helps compare countries and measures values in the workplace. The scoring of each dimension is made from 0 to 100 points (Hofstede, 1980, 1996, 2001).

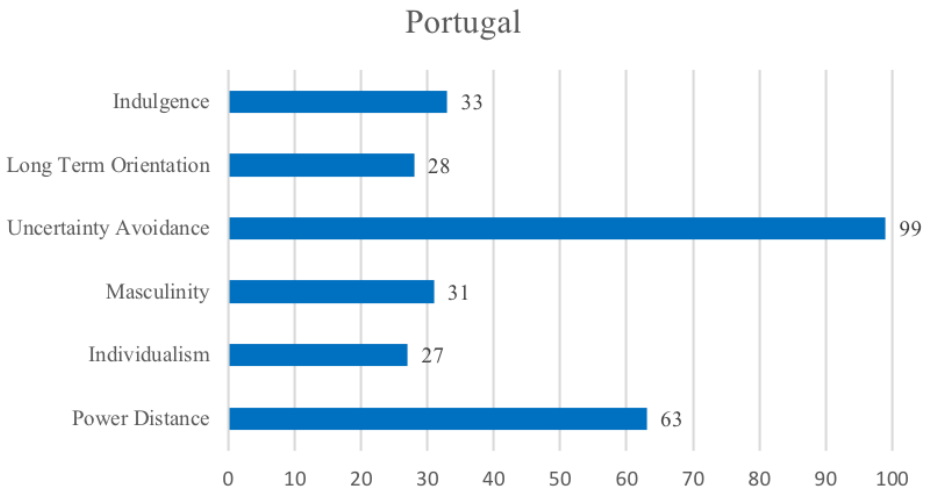

Figure 1. Hofstede's Model on Portuguese Culture. Source: Hofstede Insights – Portugal.

When realizing that executives indeed suffer from biases, it becomes increasingly interesting to study "whether cross-sectional differences in firms' capital structures can be better explained by considering managerial traits" (Hackbarth, 2008, p. 844).

2.3. Behavioral biases and capital structure decision-making

Generally, traditional financial research defends that firms have an optimal capital structure that maximizes their value (Romano et al., 2001). And while the development of theory is vastly explored, it assumes perfect market conditions and rational economic behavior, which have been proven to have limited empirical applicability (Romano et al., 2001). Behavioral finance however defends that, due to cognitive biases, managers' perceptions will differ from the market's view, which, contrary to the former, is not influenced by personal traits. While executives continue to believe that the market incorrectly values their firms, the market rationally reacts to managers' non-rational behavior (Hackbarth, 2008). And when biased managers make debt issuance decisions, their choices eventually differ from optimal ones.

Literature in this section is divided according to each bias, focusing on implications for both debt levels and debt maturity. As high debt levels only yield higher returns to a firm with an associated risk, this choice might depend on executives' preferences (Hackbarth, 2008). Additionally, some theorists suggest that behavioral biases produce a stronger effect on short-term debt (Landier & Thesmar, 2009).

Although there is still little direct evidence on the role optimism plays in decision-making (Puri & Robinson, 2007), Graham and collaborators (2013) were able to infer that optimistic managers incur in higher debt levels. This outcome is supported by theory, which states that overoptimistic managers often underestimate the possibility of bad firm performance and

overestimate the probability of good firm performance (Heaton, 2002). Thus, and as researched by Hackbarth (2008), executives typically suffer from a growth perception bias, overestimating the growth of future earnings, therefore perceiving their companies' risk securities to be undervalued by the market. Additionally, optimistic managers believe their firm to be more profitable than reality demonstrates, creating the wrong perception that financial distress is less likely to occur. Therefore, optimistic executives follow a standard pecking order preference (Myers, 1984). Ultimately, conditional on issuing debt, optimistic managers choose higher debt levels than unbiased managers, which can be considered suboptimal when debt is seen as less risky than it should. When it comes to debt maturities, optimistic managers, given the selection of higher debt levels, flow new debt earlier, thus exhibiting a preference for shorter refinancing periods (Graham et al., 2013; Hackbarth, 2008).

When it comes to the remaining biases analyzed by Graham and collaborators (2013), they did not find a significant relationship between said phenomena and capital structure decisions, mainly because US executives were not highly impacted by risk aversion, loss aversion, and present bias.

Nevertheless, studies show that CEOs who are more risk-averse try to reduce firm risk even when they have strong risk-taking incentives (Milidonis & Stathopoulos, 2014). In other words, decision makers are willing to sacrifice expected returns in order to reduce the potential variation of outcomes, meaning that a risk-averse executive typically associates risk with negative outcomes and will try to avoid incurring in risky debt to decrease the chances of bankruptcy (March & Shapira, 1987). Also, risk-averse managers might choose suboptimal levels of debt and miss out on investment opportunities that, from a rational point of view, would lead to a better long-term outcome. And when a firm is underleveraged, these executives will be reluctant to increase debt levels (Brisker & Wang, 2017). Therefore, given that "capital structure represents a major source of financial risk" (Barton & Gordon, 1988, p. 624), risk-averse executives tend to opt for lower debt levels. In that sense, managers have a preference for longer debt maturities (Graham et al., 2013).

Even though empirical studies suggest that loss aversion is a major factor in observed risk, there is still no theoretical foundation for such an important concept (Köbberling & Wakker, 2005). What is known is that "if an executive is averse to losses, then this may lead him/her to undertake actions such as 'throwing good money after bad' in hopes of turning around what appears to be a sure loss" (Graham et al., 2013, p. 106). Hence, it is expected that a loss-averse executive will incur in higher debt levels as to keep projects alive (Graham et al., 2013). Also, given that debt financing is associated with risk and loss of control (Barton & Gordon, 1988),

loss aversion is expected to be particularly relevant in this context. As for preferences over debt maturity, there were no expectations derived from literature.

Executives with a present bias, thus viewed as more impatient, tend to opt for funding that leads to higher short-term returns rather than choosing from other possibilities that represent long-term sustainability. Thus, when choosing a loan, executives might go for the option that pays out today but is less valuable than one that would pay more in the future, choosing immediate gratification over larger long-term payoffs (Hastings & Mitchell, 2011). Additionally, biased individuals prefer to incur in a loss today rather than dragging it down further along (Hardisty et al., 2013). On the contrary, if not biased, they will postpone the loss in the hopes of turning the situation around (Hardisty et al., 2013). It is therefore expected that this type of manager incurs in higher debt levels, preferring shorter maturities (Graham et al., 2013).

When looking into confirmation bias, despite Graham and collaborators (2013) not analyzing its impact on capital structure choices, research shows that economic learning might be subject to systematic biases, which can have implications on corporate decisions (Jones & Sudgen, 2001). By gathering information that helps confirm an agent's hypothesis, his/her confidence on the truth of the hypothesis will increase. And as studied in financial literature, an overconfident manager can underestimate the riskiness of future earnings and thus exhibit a preference for debt financing (Hackbarth, 2008).

2.4. Empirical Expectations

From reviewed literature, I expect Portuguese executives to be highly averse to risk and losses, moderately optimistic, to suffer from a strong present bias, and to have a tendency for confirmation bias. When compared to US managers, I expect Portuguese executives to be less optimistic, more averse to losses and risk, and to have a higher present bias.

For the impact of behavioral biases on capital structure decisions, there are a set of expectations to consider. Firstly, focusing on debt levels, I expect optimism, loss aversion, and confirmation and present biases to be positively related to the debt ratio, and risk aversion to be negatively related. As for choices on debt maturity, I am only expecting a relationship out of optimism, present bias, and risk aversion: optimism and present bias to be positively related and risk aversion to be negatively related with the short-term debt ratio.

3. Data and Methodology

In this section, I describe the method used for data collection, the process to attain participants as well as the final research sample, and the method used for data analysis.

3.1. Data Collection

3.1.1. Research Design

I aimed to test the effect of behavioral biases on capital structure decisions at Portuguese firms. Previous work has used observed executive actions to infer executive attitudes, however, this method was proven to be very limited and was viewed as a broad-based proxy (Graham et al., 2013). This study adopted a different approach, following Graham and collaborators' (2013) work, by inferring managers behavioral biases through a series of well-established tests and gambles used in the field of psychology. Additionally, determinants of capital structure, such as size and profitability, and demographic/academic variables, like gender and one's degree, were also analyzed but through direct questions. In short, this dissertation used a primary quantitative method to collect data.

This research also added confirmation bias to the analysis and adapted the type of demographic/academic questions on the questionnaire to best fit a Portuguese sample. For example, Graham and collaborators (2013) asked respondents whether they attended a prestigious school, however, in Portugal that is not as significant. Instead, the survey asked if participants studied abroad, which is far more relevant given the country's context. Moving to the analysis, I first inferred the existence of behavioral biases on Portuguese executives and related them to Graham and collaborators' (2013) US sample. Then, I followed their methodology to study the relationship between said phenomena and capital structure decisions, having two main regression models: one studying the impact on debt levels, and another on debt maturity.

3.1.2. Survey Procedure

To capture executives' psychological phenomena and measure their relationship with corporate decision-making, this study used a simple, straight-to-the-point survey. As the study focused on a sample from Portugal, the questionnaire was prepared in Portuguese using Qualtrics, an online survey tool. It was divided into four segments. Firstly, participants were asked demographic and career/academic questions, to both compare executives and to use as control variables when inferring the sole effect of psychological phenomena on capital structure. This was followed by all tests and gambles to infer behavioral biases. Next, the survey

required respondents to share information on their companies' characteristics, based on the last fiscal year, 2020. I collected information not only on capital structure, through the debt and short-term debt ratios, but also on specific information that was used as controls. To conclude the survey, participants were asked to classify their level of involvement in capital structure choices at their firm and to reply to a few questions on company investment decisions, all of which were asked in Graham and collaborators' (2013) survey. The former served as filter for the analysis as I was only interested in studying executives that have power over their firm's capital structure. The latter provided a deeper insight into the impact of behavioral characteristics in corporate decisions. The full survey is in Appendix A.

3.2. Survey Delivery

The process to deliver the survey to the right set of individuals followed a series of steps. Firstly, I researched online for events that gathered Portuguese CFOs or CEOs so that I could contact the organizers and ask for a list of names and companies. I found the CFO 360 Finance Forum, which took place on November 2019, and sent an email and a LinkedIn message to the company involved, however, I got no response. Then, I started focusing on surveys conducted by consultancy firms, where they collect the insights of Portuguese influential executives. I was able to contact three different companies, but reached a problem: the General Data Protection Regulation (GDPR). Graham and collaborators' (2013) study was conducted prior to the enforcement of GDPR rules, thus they were able to more easily collect contacts of US and non-US CEOs and CFOs. In my case however, contact details were not available online and companies who conducted the above-mentioned surveys could not disclose participants' information unless they had their permission.

Therefore, I was forced to resort to personal contacts. A close contact of mine is a businessman himself, with a big influence in the business world, and has the contacts of many executives that take part in their firms' decision-making processes. Executives were first contacted by my contact to ensure their consent before I sent them the survey. Some expressed interest in the analysis and shared the survey link with other executives they knew. Additionally, I found a study that evaluates 100 Portuguese business leaders and ranks them according to relevance, reputation, and relationship between rationality and emotions[4]. From there, I reached out to the ones who had a LinkedIn profile and sent them a message explaining

[4]The survey was conducted by OnStrategy and was published in 2021 relative to the year 2020. The list is available online.

the study I was conducting and asking for their personal contacts in case they were interested in participating.

The link to the survey was sent to participants via email. The email introduced my journey and detailed the purpose of the analysis, while mentioning how I got their contact. To ensure a higher response rate, I offered to share the conclusions of the analysis with them if they were interested.

I contacted a total of 282 executives, from CEOs and CFOs to Presidents and Executive Administrators. Overall, I received 133 complete responses in the space of one month, which represented a response rate of 47.2%. From these replies, and after data cleaning (see Section 4.1), the final sample was equal to 84 executives. For a full summary on statistics, see Section 4.2.

3.3. Modelling Approach

3.3.1. Dependent Variables

The purpose of this study was to test the effect of behavioral biases on capital structure decisions at Portuguese firms. Hence, following Graham and collaborators' (2013) study, I analyzed two different dependent variables that represent firms' capital structure decisions: the debt ratio and the short-term debt ratio, which were directly asked to participants.

3.3.2. Independent Variables

Managerial Optimism. Optimism was measured through a psychometric test that was specifically developed to gauge it: the Life Orientation Test – Revised (LOT-R), created by Scheier and collaborators (1994). Although there were many attempts in developing mechanisms to study this trait, the LOT-R has been vastly used in psychology literature (e.g., Puri & Robinson, 2007; Segerstrom et al., 2011), thus having a clear advantage of being credible and trustworthy.

Respondents were asked a total of ten questions, requiring them to indicate their level of agreement, on a 5-point scale from 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). From these ten, four were filler questions and six were scored. These were two of the six scored questions:

1. "In uncertain times, I usually expect the best."
2. "If something can go wrong for me, it will."

Questions were coded so that high values indicated optimism. There were two forms of questions: normal coded, like number 1, and reverse coded, like number 2. The former was

coded as 4 if a person answered “Strongly Agree” and 0 if the answer was “Strongly Disagree” while the latter was coded 4 if a person answered “Strongly Disagree” and 0 if the answer was “Strongly Agree”. A person was classified as optimistic if their average score was 3 or higher.

Risk Aversion. To measure risk aversion, participants were presented with a gamble of two rounds involving their lifetime income, which followed Barsky and collaborators' (1997) research in the health area. However, this study applied Graham and collaborators' (2013) modifications[5], in which participants were given a scenario that offered the possibility of choosing between two alternative new jobs, one with a safe income stream and the other being risky. In this case, respondents were forced to assume they had to take a new job, needing just to choose which conditions they would prefer.

This part was introduced with the explicit assumption that participants were the sole income earners of their household while mentioning that they had to change their job choosing between:

a) “100% chance that the job pays your current income for life.”
b) “50% chance that the job pays twice your current income for life and 50% chance that the job pays 2/3 of your income for life.”

A participant who chose option a) was considered more risk-averse than a respondent who chose option b). Depending on their choice, an extra two situations were presented where they needed to once again choose one. The option of choosing the job with 100% chance of paying their current income was the same. What changed was the risky choice: if respondents chose a), the second option would be a job with 50% chance of paying twice or 50% chance of paying 4/5 of their current income for life; if participants chose b), the second option would be a job with 50% chance of paying twice or 50% chance of paying 1/2 of their current income for life. Following their decisions, individuals were categorized as less or more risk-tolerant, from a scale of 0 (*Least risk-averse*) to 3 (*Most risk-averse*). Following the median split method (Iacobucci et al., 2015), a person was classified as risk-averse if his/her scoring was above the median of the sample, which was equal to 1.

Loss Aversion. Loss aversion was measured in the context of risky choices. Following Eric and Herrmann (2010), the first task consisted of presenting participants with six simple lotteries with a 50/50 chance of winning or losing, in which they chose to either accept or refuse to play.

[5]Modifications arose because Barsky and collaborators (1997) and Shefrin (2008) concluded that the gamble applied in the health sample might have created a status quo bias that could predispose an individual to reject a risky choice as participants decided between accepting or not a job offer with a 50/50 chance of either doubling or cutting their family income.

In all scenarios, gains were fixed at 6€ while losses varied from 2€ to 7€. For example: "If the coin turns up heads, then you lose 2€; if the coin turns up tails, you win 6€". To be considered risk-neutral, a person accepted a lottery choice with losses equal or lower to gains. Thus, if respondents rejected low-stake gambles with a positive expected return, they were considered loss-averse.

As a second task, participants' aversion to sure losses was measured. The question posed followed Graham and collaborators' (2013) question, which went as follows:

> "Last year your company invested $5 million US in a project that was expected to generate cash flows of $10 million US after one year. A year has passed and the project yielded nothing. Now you have the opportunity to invest an additional sum in this same project. There is a 20% chance that the project will generate a $10 million US cash flow in a year's time and nothing thereafter. There is an 80% chance that the new investment will generate nothing at all. How much would you be willing to invest today?"

A respondent was considered averse to sure losses if he/she replied $2 million US or more because it indicated a willingness to overpay just to avoid the loss of terminating the project today. For this analysis, I adapted the total amount of investment and projected cash flows to be more realistic for a Portuguese company – an investment of €2.5 million and projected returns of €5 million. Hence, if a person answered €1 million or more, he/she was considered loss-averse[6].

Confirmation Bias. The most common way to study confirmation bias is by analyzing people's answers when they are asked to test the veracity of a conditional rule. This is the essence of the Wason selection task, developed by Wason (1968). Although there are some psychologists (e.g., Fiddick et al., 2000) who argue that the abstract format of the Wason selection task is not ideal for participants to interpret it, there is still wide consensus on its easy applicability and proven success, being vastly used in the field of psychology to measure deductive reasoning (e.g., Jones & Sudgen, 2001; Nickerson, 1998). Thus, the Wason selection task was considered appropriate for the purpose of this research and was applied as it was initially developed.

The survey introduced participants to two conditional rules in the form of "if…then", each with four cards associated. Respondents were informed that both sides of each card could have relevant information. They were then asked to select which two cards, maximum, they would flip as to conclude the veracity of the condition. One of the problems went as follows:

[6]As most participants answered they would not invest more money into the project, I realized that either they did not understand the game properly, or that in Portugal sure losses are not representative of managers' reality. Therefore, this game was excluded from the analysis and a person was classified as loss-averse based on the game in the context of risky choices.

"If a card has a vowel on one side, then it has an even number on the other.

Cards: A; B; 4; 7"

Studies show that most people choose A and 4, however, this is not the correct answer (Evans & Ball, 2010). When choosing 4, a respondent is not adding any new information to the problem but is, in the best scenario, gathering information that is already known. Let us assume that an individual chooses A and 4. When flipping the 4 card, if there is an A on the other side, then he/she confirms that the condition is true. But if there is a B on the other side, one does not gain any new information. Why? Because the condition is one-sided, not equivalent, meaning that having a 4 does not imply that on the other side there needs to be an A. However, by choosing 7, one can verify if the condition is false: in case the flipped side shows an A, that would mean that having a vowel on one side does not always imply an even number on the other. Hence, choosing A and 7 is the most accurate answer. Therefore, participants who selected A and 4 were considered to suffer from confirmation bias. As two problems were presented, executives were classified as biased when failing at least one of them.

Present Bias. To infer a time preference for gains, one has to offer participants the possibility of opting between a smaller present reward and a larger future reward. The same goes for losses. For that, two simple questions were asked that followed the lines of Loewenstein and collaborators (2003) and that were used in Graham and collaborators (2013):

"Would you rather win US$10,000 now or win US$13,000 a year from now?"

"Would you rather lose US$10,000 now or lose US$13,000 a year from now?"

If participants showed a preference for receiving or losing money today, they were considered to suffer from a present bias. In the case of rewards, a preference for winning today implied a discount rate of more than 30%. As for losses, it showed a preference for getting things over with. Once again, the amount of money was adapted to best fit the Portuguese context, and participants were asked to choose between winning/losing 5000€ today or 6500€ in a year. From the answers, executives were ranked in three groups: people who did not show a present bias (ranked 0), individuals who exhibited a bias on rewards or losses (ranked 1), and people who showcased a bias in both situations (ranked 2). Following the median split method (Iacobucci et al., 2015), an executive was considered biased if his/her scoring was above the median of the sample, which was equal to 1.

3.3.3. Explanatory Variables

There were two categories of explanatory variables in this research, which were directly asked, and that followed Graham and collaborators' (2013) study but were adapted to the

context of a Portuguese sample. Firstly, demographic and career/academic related variables were included as literature shows a relationship between them and behavioral biases. Those are:

Years of Experience: Executives with more experience tend to feel more optimistic about their decisions and search deeper for support to their own opinions and convictions (Jones & Sudgen, 2001).

Gender: Research shows that there are many differences between men and women, two being that men tend to be more optimistic and more risk-tolerant (Jacobsen et al., 2014).

Level of Education: People with higher degrees of education, for instance an MBA, might be viewed as more conservative, as they feel the need to attain extra knowledge opposed to taking a risk and trusting their capabilities (Graham et al., 2013).

Degree: People's background, whether it is in finance, accounting, marketing, engineering, etc., could affect their confidence on making certain decisions.

Education Abroad: Executives who studied abroad might have captured the way of thinking and operating of other countries, which may show differences in their decision-making process.

It is important to note that executives' age, current position at their firm, and tenure in current position were accounted for but were removed from the analysis (see Section 4.4.1).

Then, I included a set of company-specific elements that follow what standard financial theory (e.g., Titman & Wessels, 1988) identifies as determinants of a firm's capital structure:

Size: The size of a company can determine many factors. For example, larger firms typically incur in more debt (Frank & Goyal, 2007). In Portugal, a firm is considered large if it has a yearly sales volume of over €50 million[7].

Industry: Industry classification may influence companies' debt level choices, as some are associated with higher average debt levels than others (Frank & Goyal, 2009). In fact, industry fixed effects have been part of capital structure analyses since early times (e.g., Smith & Watts, 1992; Bradley et al., 1984).

Public: Whether a firm is public or private can have implications in corporate decisions. Typically, a public firm incurs in lower debt levels (Brav, 2009).

Family-owned business: There are many companies in Portugal that are family-owned, which can have a big role in decision-making due to the need of assuring family control (e.g., González et al., 2013; Blanco-Mazagatos et al., 2007).

[7]As defined by the Portuguese National Institute of Statistics.

Return on Assets (ROA): This ratio is an indicator of a firm's profitability relative to its total assets. Although theorists do not agree on the type of relationship between profitability and leverage, there is consensus on its existence and importance (e.g., Titman & Wessels, 1988; Frank & Goyal, 2009; Hovakimian et al., 2001).

I also analyzed historical growth, which was defined as the average 3-year growth rate on a company's sales revenue (Graham et al., 2013) but ended up excluding it from the analysis (see Section 4.4.1).

3.3.4. Regression

In order to identify the relationship between behavioral biases and capital structure choices, this dissertation relied on the method used by Graham and collaborators (2013): a linear regression model. In Appendix B, there is an overview of all variables used in this study, based on what was already discussed. Indexing the number of observations as i, the regression model went as follows:

$$Y_i = \alpha + \beta_1 Optimism_i + \beta_2 RiskAversion_i + \beta_3 LossAversion_i + \beta_4 Confirmation\ Bias_i + \beta_5 PresentBias_i + \boldsymbol{\theta}\mathbf{X} + \boldsymbol{\gamma}\mathbf{I} + \varepsilon_i$$

Where Y is the debt ratio or the short-term debt ratio and ε is the error term. Vector **X** contains the control variables already discussed: (i) Gender; (ii) Years of Experience; (iii) Education Level; (iv) Degree Choice; (v) Studied Abroad; (vi) Size; (vii) Public; (viii) Family-Owned; (ix) ROA. Additionally, I controlled for industry fixed effects (**I**). I used standard tests to assess whether the coefficients were statistically significant from zero. Results are presented in the next section.

4. Results

4.1. Data Preparation

As previously mentioned, a total of 133 complete responses were obtained, however, the final sample equaled 84 executives as 49 replies were excluded from the analysis. Firstly, 40 participants were removed as they classified their level of involvement with capital structure decisions to be lower than 75% (out of 100%). The rationale to disregard those was because the present study was only interested in executives who have a vital word in firm decisions. Hence, as executives self-classified, it was safer to assume a strong/conservative criterion. Following this, respondents' company data was analyzed. If participants did not provide any data, by writing "Not Applicable" or "Will not disclose", or just put 0 in all financials requested, they were excluded from the relevant sample. For this part, responses were analyzed case by case, leading to the removal of 9 participants. Finally, to detect the presence of outliers, the median absolute deviation method was applied, as it is seen as a more robust alternative for exclusion when compared to the traditional method around the mean (Leys et al., 2013). In this analysis, however, no respondent was removed for this reason, as no outliers were found in both dependent variables: the debt ratio and the short-term debt ratio.

4.2. Summary Statistics

The self-reported information on characteristics of the firms in this sample was analyzed and is detailed in Table C1 (Appendix C). Only 9.5% of firms were public, which may have brought advantages to this dissertation as private firms are typically less researched (Graham et al., 2013). Moreover, 58.3% were family-owned businesses, which is a fair representation of this type of firms, as around 70% of businesses in Portugal are family-owned (Associação das Empresas Familiares, 2021). As for sales revenue, my sample had a mean of €529.3 million, and 43% of firms were large enterprises (see Footnote 7). There were big fluctuations between firms in terms of historical growth, ROA, and the debt-to-equity ratio[8] (*SD* = 54.6, 55.8, 423.2, respectively), which were expected as information retrieved was from the last fiscal year, 2020, an atypical year for all industries and businesses due to the COVID-19 pandemic.

When considering public firms' collected data, observations were somewhat sparse, which may be explained by the relatively small sample size ($N = 8$). Still, they were on average bigger,

[8]In this dissertation, I initially considered analyzing the debt-to-equity ratio as a dependent variable, as it also represents capital structure decisions (Myers, 2001). However, the ratio had high dispersion levels between firms, making it necessary to exclude a big number of data retrieved as to account for outliers. Hence, this ratio was removed from the analysis.

with a mean sales volume of €1.69 billion, and typically incurred in debt with longer maturity, as the average short-term debt ratio was lower (M = 13.4% vs M = 33.8%). Family-owned firms were also above the mean in size (M = €671.7 million) and had slightly higher debt levels than the full sample (M = 34.1%). Also, debt-to-equity levels were less dispersed, but the percentage was on average lower.

In terms of firms' investment decisions, on average, companies did not show a preference for funding investments with either internal or external funds. Nevertheless, public firms showed, on average, a slight preference for external funding (M = 3.63). At the same time, when forced to fund projects externally, on average, firms had a preference for issuing debt (M = 2.13), which was especially visible with family-owned companies (M = 1.73). This is aligned with the fact that a family's main concern is with passing the company across generations, basing financial decisions on how much they will affect family control, preferring to deal with debtholders as opposed to equity-holders (Blanco-Mazagatos et al., 2007). For more detail see Table C2, Appendix C.

Information on executives' personal characteristics was also retrieved (see Table C3, Appendix C). A total of 67.9% of participants were CEOs, the other 32.1% were mostly CFOs and Executive Administrators. From the overall sample, 84.5% were male. This is aligned with the fact that there are still fewer women in higher positions at firms, as they have a lower probability of career advancement when compared to men[9]. Additionally, on average, executives were 57 years old, having experienced around 33.7 years working, with a mean of 16.5 years in their current position. When it came to education, 28.6% of executives had an MBA, and more than two thirds had a degree in either Economics or Business. Finally, almost half of executives had the opportunity to study abroad.

4.3. Are Portuguese executives biased?

The first step of this analysis was understanding whether Portuguese executives are biased and to what degree there are differences from Graham and collaborators' (2013) sample of US executives. In this dissertation, behavioral biases were represented as dummy variables, meaning that an executive either is biased or not (see Section 3.3.2). As one can see in Table 1, 42.9% of executives were optimistic, which means that less than half of participants are confident in their success and capitalize it into their decisions. Also, 51.2% of executives were

[9]Information retrieved from a study conducted by McKinsey&Company: "Achieving gender balance in Leadership: Why and how" (2019).

risk-averse, which translated to most participants having a low willingness to take on volatile choices. The same goes for loss aversion: almost two thirds of the sample exhibited loss aversion behavior in the context of risky choices. Looking at confirmation bias, the results were quite high as 57.1% of executives showed that they search for validation of their beliefs rather than trying to contradict them. Finally, close to one third of the sample revealed present bias. In the end, biases were aligned with what literature defends, except when it came to present bias, as I was expecting a higher result from Portuguese executives given the general short-term orientation of the lay population (Hofstede, 2001).

Table 1

Executives' behavioral biases

	Observations	Percentage
Optimism	36	42.9
Risk Aversion	43	51.2
Loss Aversion	55	65.5
Confirmation Bias	48	57.1
Present Bias	32	38.1

Despite some criteria used in the creation of the variables not being similar to those of Graham and collaborators (2013), I compared my sample of Portuguese executives to their sample of US executives. I conducted a two-sample t-test analysis, visible in Table 2[10]. US executives are more optimistic, more risk-tolerant and less averse to losses than Portuguese executives (all p's < 0.01). Although the means suggest Portuguese managers have a higher present bias than US executives, that difference was not significant. Overall, results were aligned with literature that defends that behavioral biases vary from country to country and that cross-cultural analyses are necessary.

Table 2

Differences in biases on Portuguese executives vs US executives (T-test)

	Portuguese Executives	US Executives	Difference
Optimism	42.9%	80.2%	(0.373)***

[10]I replicated this analysis using Graham and collaborators' (2013) criteria for each bias. Results were similar to those presented but the differences between samples on risk and loss aversion were not significant. Nevertheless, the remaining of the analysis follows the results from Table 2 as I believe using the same criteria as the authors would misrepresent Portuguese executives' biases, thus limiting the comparison. Firstly, the game used in Graham and collaborators (2013) for loss aversion was either not well interpreted by participants in this study or was not suited for their reality. Additionally, to evaluate risk aversion, they used a subjective criterion that removed information from the gamble in question, whereas mine is strongly supported by literature (e.g., Iacobucci et al., 2015), and allows for less information to be lost.

Risk Aversion	51.2%	9.8%	0.414***
Loss Aversion	65.5%	8.5%	0.570***
Confirmation Bias	57.1%	-	-
Present Bias	38.1%	32.9%	0.052

Note. US Executives' information was based on the results from Graham and collaborators' (2013) study, sample of 1001 US CEOs.
*** $p<0.01$

4.4. Are behavioral biases related with capital structure choices?

4.4.1. Preliminary Analysis

Following Graham and collaborators' (2013) approach, I conducted a series of steps to analyze information collected on demographics and firm characteristics, and their relationship with the biases and the debt and short-term debt ratios.

When looking for executives to participate in this study, I gathered information on not only CEOs but also other firm members (see Table D1, Appendix D). However, most studies on the relationship between managerial attitudes and corporate actions typically focus solely on CEOs, as previous research showed that there is a significant difference between executives' biases depending on their role at the company (Graham et al., 2013). Having this in mind, analyzing the impact of behavioral biases on capital structure choices would only be possible if filtering per position at the firm. Yet, the mentioned studies were based on the particularities of a US sample, which as seen in Section 4.3, is statistically different from this dissertation's sample. Additionally, research shows that while some cultures have a preference for individual decision-making, like the US, others endorse the involvement of multiple people (Yates & de Oliveira, 2016). As part of a collectivist society (Hofstede, 1980), Portuguese executives encourage financial decisions to be made by more than just a CFO or CEO, often including equity-holders and other workers in the process (LeFebvre & Franke, 2013). Also, the 84 executives considered as relevant sample self-identified as having a big involvement in capital structure decisions, and given that majority of firms in the analysis were family-owned, decisions typically go through several members of the board, due to an overlap of ownership and management (Faccio & Lang, 2002).

Still, I conducted univariate regressions to infer the impact of an executive's role on behavioral biases and decisions on debt levels and maturity. Looking at Table 3, one can see that, for Portuguese executives, there was no significant relationship between their role at the company and the levels of optimism, risk and loss aversion and confirmation and present biases. Hence, one may infer that the position an executive has does not influence the degree of his/her biases. Likewise, both the debt and short-term debt ratios, which are representative of capital

structure decisions, had no relationship with the role of an executive. Therefore, the main analysis included all executives, regardless of their position at the company, as it was possible to infer that the role is not relevant.

Table 3

Univariate regressions between role and each behavioral bias and debt and short-term debt ratios

	Optimism	Risk Aversion	Loss Aversion	Confirmation Bias	Present Bias	Debt Ratio	Short-term Debt Ratio
Role	-0.078	-0.01	0.092	0.023	0.07	-0.018	-0.024
	(0.117)	(0.118)	(0.114)	(0.117)	(0.113)	(0.062)	(0.082)

Note. Role is a dummy variable, 1 if the role is CEO, 0 if otherwise. All remaining variables are defined as in Appendix B.
[a]Robust standard errors in parentheses.
* p<0.1, ** p<0.05, ***p<0.01

Furthermore, I analyzed the correlations between firm and executive characteristics, including demographic and career/academic variables, and behavioral biases (see Table D2, Appendix D). Based on this analysis, age, tenure in current position, and historical growth were not included as control variables. Essentially, historical growth and ROA measure the same specificity, which is a firm's profitability. Therefore, plus the fact they had a strong correlation between them ($r = 0.805$; $p < 0.001$), I removed historical growth from further analysis, as it would result in multicollinearity issues. Likewise, age and tenure in current position were removed given the high correlation with years of experience ($r = 0.942$ and 0.401, respectively; $p < 0.001$)[11].

Overall, there were not many significant correlations between firm and executive characteristics, still, there are some highlights. Firstly, an executive with a higher tenure at his/her current position is more averse to losses ($p < 0.01$). Secondly, executives who have invested more into their education, meaning they have a higher degree than a bachelor's, tend to exhibit a higher confirmation bias and tend to have studied abroad ($p < 0.05$). Finally, people who have worked longer at their current position, and thus are older, are less likely to have studied in other countries ($p < 0.01$). When it comes to firm characteristics, optimistic executives work more at non-family-owned firms ($p < 0.05$) and managers who suffer less from present bias are associated with private and smaller firms ($p < 0.05$ and $p < 0.01$, respectively).

[11]Choosing ROA over historical growth was based on what is more commonly used in financial literature (for e.g., Titman & Wessels, 1988; Frank & Goyal, 2009). Moreover, years of experience was selected as it serves as the best representation of acquired biases throughout an executive's career (age refers to an individual's full life and tenure in current position is focused solely on the role currently occupied).

Additionally, larger firms tend to be public ($p < 0.001$) with lower levels of historical growth ($p < 0.05$).

Moreover, I investigated whether capital structure choices were associated with executives' personal characteristics by conducting univariate regressions, visible in Table 4. Overall, larger firms typically incur in more debt, presenting higher debt ratios ($p < 0.1$) and public firms show a preference for debt with longer maturity ($p < 0.01$). Also, more profitable firms incur in less debt and, when they do, prefer long-term debt ($p < 0.01$). Executives who did not study abroad exhibit a preference for incurring in debt, especially with shorter maturity ($p < 0.05$). Finally, managers with more experience incur in higher debt levels ($p < 0.05$) and male executives prefer debt with longer maturity ($p < 0.1$).

Table 4

Univariate regressions between the debt and short-term debt ratios and all biases and control variables in the analysis

Panel A: Behavioral Biases					
	Optimism	Risk Aversion	Loss Aversion	Confirmation Bias	Present Bias
(1)	0.052	-0.1	0.088	-0.018	-0.018
	(0.062)	(0.060)	(0.061)	(0.062)	(0.064)
(2)	-0.106	0.017	-0.054	-0.056	-0.014
	(0.077)	(0.079)	(0.084)	(0.081)	(0.081)
Panel B: Demographic/academic Variables					
	Gender	Years of Experience	Education Level	Degree Choice	Studied Abroad
(1)	-0.051	0.006**	-0.089	0.063	-0.118**
	(0.079)	(0.002)	(0.067)	(0.063)	(0.059)
(2)	-0.194*	0.005	-0.073	0.121	-0.175**
	(0.107)	(0.004)	(0.084)	(0.077)	(0.074)
Panel C: Firm-specific Variables					
	Size	Public	Family-Owned	ROA	
(1)	0.123*	-0.043	0.049	-0.075***	
	(0.060)	(0.098)	(0.062)	(0.019)	
(2)	0.123	-0.226***	0.065	-0.099***	
	(0.078)	(0.066)	(0.080)	(0.033)	

Note. (1) Debt ratio; (2) Short-term debt ratio. All variables are defined in Appendix B.
[a]Robust standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

4.4.2. Main Analysis

The debt and short-term debt ratios were examined in a multivariate setting, through an OLS regression analysis (see Section 3.3.4 and Appendix B). Table 5 reports the results of the

relationship between behavioral biases and a firm's debt ratio (for full table see Table D3, Appendix D). Without any controls, there were significant results for risk and loss aversion. This means that the more risk-averse a Portuguese executive is, the less debt the firm uses to fund investments, and a manager averse to losses is positively related with his/her firm's debt ratio. When adding controls for demographics and firm characteristics, these relationships were maintained, and loss aversion was actually reinforced (from $p < 0.1$ to $p < 0.05$). Additionally, optimism became significant, which highlighted the fact that optimistic managers are associated with incurring in higher debt levels. All these relationships are supported by literature. Present bias, however, did not impact the debt ratio. As far as confirmation bias goes, literature points out to a positive relationship with debt, however, although not significant, in this analysis it was negatively related to the debt ratio. When introducing industry fixed effects, the effect produced by behavioral biases became less predominant.

Table 5

Multivariate regression of firm and executive characteristics on capital structure decisions (debt ratio)

Dependent Variable: Debt Ratio			
	OLS		
	(1)	(2)	(3)
Optimism	0.050	0.109*	0.105
	(0.066)	(0.062)	(0.075)
Risk Aversion	-0.105*	-0.112*	-0.085
	(0.061)	(0.061)	(0.073)
Loss Aversion	0.109*	0.134**	0.137**
	(0.065)	(0.063)	(0.065)
Confirmation Bias	-0.022	-0.018	-0.019
	(0.062)	(0.065)	(0.069)
Present Bias	-0.03	0.003	-0.027
	(0.064)	(0.069)	(0.080)
Control Variables	No	Yes	Yes
Industry Dummies	No	No	Yes
Observations	84	84	84
R-squared	0.074	0.302	0.445

Note. This table reports the regression analysis of behavioral biases on debt levels in Portugal. All variables are defined in Appendix B. Industry Classifications are explained in Table D5, Appendix D.
Note 2. (1) Without controls; (2) With controls before industry dummies; (3) With controls and industry dummies.
[a]Robust standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 6 reports the results of behavioral biases on a firm's short-term debt ratio (for full table see Table D4, Appendix D), which led to similar takeaways regardless of adding controls and industry effects. Expectations based on literature were focused on the impact of optimism, present bias, and risk aversion. Firstly, Graham and collaborators (2013) found a strong positive relationship between optimistic managers and short-term debt, which was supported by other researchers (e.g., Hackbarth, 2008). Secondly, literature defends that risk-averse managers seek longer debt maturities while executives with present bias prefer shorter ones (Graham et al., 2013). However, in my sample, neither optimistic, risk-averse, nor present biased executives exhibited a specific preference, and the relationship was actually inconclusive. Moreover, although not significant, loss-averse managers sought longer debt maturities while executives with confirmation bias looked for shorter maturities. So, it was possible to conclude that behavioral biases do not produce an effect in Portuguese executive's decisions when it comes to debt maturity.

Table 6

Multivariate regression of firm and executive characteristics on capital structure decisions (short-term debt ratio)

Dependent Variable: Short-term Debt Ratio			
	OLS		
	(1)	(2)	(3)
Optimism	-0.113	-0.042	0.016
	(0.079)	(0.077)	(0.093)
Risk Aversion	0.008	-0.007	0.007
	(0.081)	(0.082)	(0.102)
Loss Aversion	-0.068	-0.053	-0.056
	(0.085)	(0.081)	(0.078)
Confirmation Bias	-0.05	-0.073	-0.085
	(0.081)	(0.083)	(0.081)
Present Bias	-0.02	0.024	0.074
	(0.080)	(0.092)	(0.108)
Control Variables	No	Yes	Yes
Industry Dummies	No	No	Yes
Observations	84	84	84
R-squared	0.036	0.276	0.429

Note. This table reports the regression analysis of behavioral biases on debt maturity in Portugal. All variables are defined in Appendix B. Industry Classifications are explained in Table D5, Appendix D.
Note 2. (1) Without controls; (2) With controls before industry dummies; (3) With controls and industry dummies.
[a]Robust standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

5. Discussion

5.1. Main findings

This dissertation intended to study the impact of behavioral biases in capital structure decisions in a sample from Portugal. Firstly, I aimed to understand whether Portuguese managers are biased, and how that differs from US managers from Graham and collaborators' (2013) sample. Secondly, I aimed to study the relationship between executives' optimism, risk aversion, loss aversion, confirmation bias, and present bias and companies' choices of debt levels and maturity. A survey-based approach was used to infer behavioral phenomena of Portuguese executives and to collect company data and individual information.

When inferring whether Portuguese executives are biased, most results aligned with previous literature. Based on my analysis of Hofstede's (1980) model, the Portuguese population can be described as moderately optimistic, highly averse to risk and losses, has a tendency for confirmation bias, and is expected to have a strong present bias. This sample of executives aligned with these expectations, except when it came to present bias, as they were less biased than predicted. This may be due to present bias being heavily associated with income and education levels (Becker & Mulligan, 1997). People with lower income levels are more incentivized to look for immediate gratification over future rewards (Becker & Mulligan, 1997). Furthermore, people who are more educated tend to have a longer-term perspective of outcomes (Becker & Mulligan, 1997). The analyzed executives occupy high roles at their firms, thus receiving higher incomes, and are highly educated with 64.3% having more than a bachelor's degree. Hence, on average, they are wealthier and more educated than the average Portuguese[12]. When comparing non-US to US managers, Graham and collaborators (2013), despite placing all non-US executives into one homogeneous group, which could have led to misleading conclusions, were able to infer a significant difference between samples regarding all biases analyzed by them. US managers were more optimistic, suffered from a lower present bias, and were less averse to risk and losses. In this dissertation's analysis, Portuguese executives indeed differed from US managers, and all relationships were confirmed except for present bias.

Lastly, it came down to whether behavioral biases produce an effect in capital structure decisions, represented by choices on debt levels and maturity. In general, behavioral phenomena had a weaker impact when industry effects were introduced. However, due to a relatively small sample size, the 84 companies were split into a total of 13 industries (see Table

[12]Conclusions retrieved from PORDATA when looking at the average monthly income of workers per level of qualification and the 15 years old or higher population per level of education.

D5, Appendix D), and thus industry dummies ended up extremely "disperse". Therefore, one cannot state that differences in industries eliminate with certainty the effects of most biases. Hence, the remaining discussion will be centered on the regression without industry dummies.

Focusing on decisions over debt levels, I was able to infer that optimistic and loss-averse managers incur in higher levels of debt, while risk-averse managers prefer lower debt levels. All these significant relationships follow literature. Although not significant, present bias had a positive relationship with debt levels, accommodating expectations. As for confirmation bias, the relationship was actually negative, thus contradicting literature. This may be explained by the current world panorama and lack of future expectations. A study conducted with Portuguese CEOs (PWC Portugal, 2019) showed that managers are feeling a lot more unsure and pessimistic towards the economy's future. Thus, they might not feel as confident about their own opinions and convictions, as there is no way to confirm them through market analyses. Nevertheless, and relating directly to Graham and collaborators (2013), I was able to infer stronger effects from behavioral biases as opposed to their research, which is aligned with the fact that Portuguese executives not only are significantly different from US managers but are also more biased (see Section 4.3).

Moving into preferences over debt maturity, I was expecting to see a significant impact of optimism, risk aversion and present bias, however, there was no overall relationship between executives' behavioral biases and the short-term debt ratio. There are possible justifications for this given external conditions and dynamics that come in play. Recent research conducted by the International Monetary Fund (Chen et al., 2019) showed that firms' debt maturities are mainly determined and explained by corporate characteristics, such as profitability and access to collateral. In fact, from Table 4, it is possible to see that ROA, a measure of profitability, was negatively related with the short-term debt ratio, at a significance level of 1%. So, impacts would be, a priori, less predominant given that firm specific factors are of higher importance when it comes to opting for short-term debt. Additionally, debt maturity can be sensitive to global factors (Chen et al., 2019). As previously stated, company data was retrieved for 2020, which marked an atypical economic year for businesses due to the COVID-19 pandemic. This crisis has led many countries, from emerging to developed, to an accentuated collapse of capital flows (Bolton et al., 2020), and firms globally were left with massive shocks to their sales. Portugal is no exception, as companies' profitability was heavily impacted (Kozeniauskas et al., 2020). Hence, during a crisis like this, given the necessities faced by companies due to an expected decrease in profitability, debt maturity drops (Chen et al., 2018; Myers, 1984). Therefore, behavioral biases might not have produced an effect on short-term debt because

there were certain procedures that firms followed due to crisis that are stronger than executives' personal preferences.

Still, one can state that Portuguese executives are more biased than US managers, and that their behavioral specificities do impact decisions on capital structure when it comes to choosing to incur in debt as opposed to other financing sources.

5.2. Implications

This study provides relevant findings to the academic sphere. Capital structure decisions are essential to the long-term sustainability of a company (Brounen et al., 2006). As financial literature focused for many years on explaining said choices with firm- and industry-level factors, behavioral finance is still very new, and does not have much research surrounding it. By detecting that Portuguese executives are moderately optimistic, highly risk- and loss-averse, have a confirmation bias, and suffer from a minor present bias, I am able to support both the idea that managers are irrational and the research that suggests exploring the role of managerial heterogeneity in corporate decision-making (e.g., Frank & Goyal, 2009). Furthermore, although literature has acknowledged cross-cultural differences on behavioral biases (e.g., Graham et al., 2013), there were no previous studies on the relationship between psychological phenomena and corporate decisions outside the US. By concluding that Portuguese executives differ from US managers, and that the impact of behavioral biases on firms' debt levels is stronger in Portugal than in the US, I was able to not only add different conclusions to existing literature, but also reinforce the importance of replicating studies with executives and companies from different countries. Moreover, this dissertation used a survey-based approach to infer behavioral biases and collect personal and company information, which supports Graham and collaborators' (2013) method of analysis and might open in the financial world the curiosity of analyzing behavior through psychology's methods (e.g., Scheier et al., 1994; Wason, 1968). Finally, I introduced a new bias to Graham and collaborators' (2013) study and adapted the selected personal information requested to best fit my sample, which may help broaden the view on managerial attitudes' impact in corporate actions by incentivizing the in-depth exploration of other biases and of managerial heterogeneity as a whole.

Moreover, this dissertation has practical applications to Portuguese firms' ecosystem. As information was retrieved directly from some of the most influential executives in the country, thus people other entrepreneurs and owners look up to, it may serve as a good example for any business in Portugal. Firstly, if executives become aware of the impact that their cognitive biases have on capital structure, they might be more careful when making decisions, seeking

the guidance of other decision makers at their firm more. Likewise, business owners might start assessing their managers in the light of behavioral biases, for instance when recruiting, and not just on technical ability. Furthermore, this study suggests companies should take into consideration the effects of optimism and risk and loss aversion in capital structure decision-making, highlighting the importance of complementing what is learnt from traditional finance with accounting for individual differences. In particular, given the economic crisis we are facing at the moment (Hadjimichalis, 2021), firms must be extra cautious with loss-averse executives, who tend to incur in higher debt levels just for the sake of keeping projects alive that would otherwise be obsolete (Graham et al., 2013), and risk-averse managers, who seek for lower debt levels even if that would be more beneficial to their businesses (Milidonis & Stathopoulos, 2014). Finally, this research acknowledges that biases do not seem to affect debt maturity choices, thus suggesting that the impact of individual heterogeneity should be more taken into consideration when firms are choosing a financing source.

5.3. Limitations and Future Research

This dissertation has a set of limitations that need to be accounted for and pave the way for future research. Firstly, I had limited access to my population of analysis, due to GDPR rules that made it very demanding to spread the survey to a higher number of executives. Thus, my sample size became compromised and might not be a fair representation of the underlying population and firms that constitute Portugal. Future researchers might want to partner with big companies who conduct surveys on CEOs and CFOs, like the ones that I tried to reach out to at first, as to have access to the most influential executives from Portugal and be able to collect information without restrictions.

Secondly, to truly evaluate executives' behavioral biases, information was collected through a survey, which meant using self-reported data. As surveys measure beliefs and not actions (Graham et al., 2013), executives may have misunderstood some of the games used for inferring behavioral biases or might have answered with what they believed researchers wanted to hear. Furthermore, retrieved company data could not be independently verified, so I was left with approximate/rounded financial numbers, which may have compromised the analysis due to lack of accuracy. As to solve this problem, future research might involve working directly with specific firms in the country, that are representative of the population under study, as to evaluate the behavior of decision makers in a working situation and to have access to complete financial statements.

Also, as the year of analysis was 2020, marked by the COVID-19 pandemic, companies' financials, such as the debt and short-term debt ratios, ROA, or size, may not have represented the business at its core. Likewise, executives might feel more pessimistic or more averse to risk than usual, thus raising questions on whether conclusions inferred would be the same if it was a typical business year. Hence, it would be interesting to introduce in future analysis a period of pre-crisis, with a year of economic stability, as to see if results would differ.

Moreover, when comparing the biases of Portuguese executives and US executives from Graham and collaborators' (2013) study, the criteria used to classify participants as risk- and loss-averse, and with present bias were non-identical. Although they were modified as to best fit the reality of my sample, one cannot safely state that differences observed between samples were solely due to cultural differences, as they could have also emerged from the dissimilar methods applied. Therefore, future researchers should be extremely careful when choosing the criteria to classify biases, if they intend to compare their samples with ones from other studies.

Simultaneously, given the survey was conducted in one point in time, it was impossible to infer causality, meaning that interpreting the relationship between behavioral biases and corporate decisions needs to be very cautious. For example, one cannot confirm if a risk-averse executive uses less debt or if a firm that has a policy of using high debt levels attracts risk-tolerant managers. The same goes for optimism and loss aversion. Overall, I could only infer the existence of a relationship between these phenomena and capital structure decisions but could not say if it was a question of self-selection or matching (Graham et al., 2013). Therefore, future research could study this relationship for a longer period of time and explore ways to deal with said endogeneity problems, for example through the introduction of instrumental variables (Katchova, 2013).

Additionally, this analysis was restricted to a Portuguese sample, as previous research showed the existence of a generalization issue with studying behavioral biases and their impact in corporate decisions. Therefore, the results here presented cannot be applied in other countries with different cultural and economic realities. Thus, future research could be focused on analyzing the impact of psychological phenomena on capital structure decisions in other countries around the globe. For example, Chinese executives could be an interesting subject of analysis as China is an emerging country, which has different corporate objectives and behavior than Portugal and the US (Allen, 2005), and the lay population exhibits different cultural characteristics from the samples already analyzed (Hofstede, 1980). Likewise, the relationship inferred between psychological phenomena and capital structure cannot be associated to other corporate decisions firms might have, as not all decisions are of the same nature and biases

might influence them in different ways (Graham et al., 2013). Therefore, future research could explore the effects of behavioral biases on other corporate decisions, such as mergers & acquisitions and compensation policies.

To continue contributing to literature on behavioral finance, future analyses could also study other cognitive biases' impact on corporate decisions, such as sunk-cost fallacy (Agarwal et al., 2015), overconfidence (Mcgraw et al., 2004), or anchoring bias (Cen et al., 2013). Furthermore, other controls could be incorporated into research, mainly firm specificities, for example volatility and uniqueness (Titman & Wessels, 1988), and individual characteristics, such as executives' civil state or number of children (Chaulk et al., 2003).

Finally, as it was out of scope, I did not study tools that could mitigate the effects of psychological phenomena in capital structure decision-making. Regardless, specialists show that debiasing may be essential (e.g. Filbeck et al., 2017). Although behavioral finance is a field in which studies are still surface level, psychology has a wide research around mechanisms that attempt to improve people's decisions. Two tools have been reaching successful results on behavioral debiasing in particular: dialectical bootstrapping (Herzog & Hertwig, 2009; Herzog & Hertwig, 2014) and multiple explanation (Hirt & Markman, 1995). Hence, it would be interesting to understand whether psychological techniques can moderate the effects that Portuguese executives' behavioral biases have on capital structure choices. This could be done through an experimental study in which executives are randomly assigned to two groups: one that goes through a process of debiasing and another who does not. If proven that these strategies can moderate biases' effects, then it might be valuable not only for companies to train executives on identifying and reducing the impacts of their own behavioral phenomena, but also for universities to include the study of behavioral finance to further educate the executives of tomorrow.

6. Conclusion

Behavioral finance enters in discussion as to complement traditional financial theory and the studies around the impact of firm- and industry-level characteristics on firms' corporate decisions. This study's conclusions reinforce the idea that managers do suffer from biases that prevent them from acting rationally and that those biases produce effects on companies' debt levels. I hope this dissertation serves as a step towards raising awareness and building more research around this field of finance in the world, especially in Portugal.

7. Reference List

Agarwal, S., Green, R. K., Rosenblatt, E., & Yao, V. (2015). Collateral pledge, sunk-cost fallacy and mortgage default. *Journal of Financial Intermediation*, *24*(4), 636–652. https://doi.org/10.1016/j.jfi.2014.10.001

Allen, F. (2005). Corporate governance in emerging economies. *Oxford Review of Economic Policy*, *21*(2), 164–177. https://doi.org/10.1093/oxrep/gri010

Associação das Empresas Familiares. (2021). *Numbers & facts*. https://empresasfamiliares.pt/?lang=en

Barsky, R. B., Kimball, M. S., Juster, F. T., & Shapiro, M. D. (1997). Preference parameters and behavioral heterogeneity: an experimental approach in the health and retirement survey. *The Quarterly Journal of Economics*, *112*(2), 537–579. https://doi.org/10.1162/003355397555280

Barton, S. L., & Gordon, P. J. (1988). Corporate strategy and capital structure. *Strategic Management Journal*, *9*(6), 623–632. https://doi.org/10.1002/smj.4250090608

Becker, G. S., & Mulligan, C. B. (1997). The endogenous determination of time preference. *The Quarterly Journal of Economics*, *112*(3), 729–758. https://doi.org/10.1162/003355397555334

Bertrand, M., & Schoar, A. (2003). Managing with style: the effect of managers on firm policies. *The Quarterly Journal of Economics*, *118*(4), 1169–1208. https://doi.org/10.1162/003355303322552775

Blanco-Mazagatos, V., de Quevedo-Puente, E., & Castrillo, L. A. (2007). The trade-off between financial resources and agency costs in the family business: an exploratory study. *Family Business Review*, *20*(3), 199–213. https://doi.org/10.1111/j.1741-6248.2007.00095.x

Bolton, P., Buchheit, L., Gourinchas, P.-O., Hsieh, C.-T., Panizza, U., & Mauro, B. W. di. (2020). *Born out of necessity: a debt standstill for covid-19* (Issue 103). https://cepr.org/active/publications/policy_insights/viewpi.php?pino=103

Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: theory and evidence. *The Journal of Finance*, *39*(3), 857–878. https://doi.org/10.1111/j.1540-6261.1984.tb03680.x

Brav, O. (2009). Access to capital, capital structure, and the funding of the firm. *The Journal of Finance*, *64*(1), 263–308. https://doi.org/10.1111/j.1540-6261.2008.01434.x

Brisker, E. R., & Wang, W. (2017). CEO's inside debt and dynamics of capital structure.

Financial Management, *46*(3), 655–685. https://doi.org/10.1111/fima.12169

Brounen, D., de Jong, A., & Koedijk, K. (2006). Capital structure policies in Europe: survey evidence. *Journal of Banking and Finance*, *30*(5), 1409–1442. https://doi.org/10.1016/j.jbankfin.2005.02.010

Burton, E. L. (2015). The impact of risk aversion on economic development in Portugal. *Perspectives on Business and Economics*, *33*(4), 27–38. https://core.ac.uk/download/pdf/228652238.pdf

Busenitz, L. W., & Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making. *Journal of Business Venturing*, *12*(1), 9–30. https://doi.org/10.1016/S0883-9026(96)00003-1

Cen, L., Hilary, G., & Wei, K. C. J. (2013). The role of anchoring bias in the equity market: evidence from analysts ' earnings forecasts and stock returns. *The Journal of Financial and Quantitative Analysis*, *48*(1), 47–76. https://doi.org/10.1017/S0022109012000609

Chaulk, B., Johnson, P. J., & Bulcroft, R. (2003). Effects of marriage and children on financial risk tolerance: a synthesis of family development and prospect theory. *Journal of Family and Economic Issues*, *24*(3), 257–279. https://doi.org/10.1023/A:1025495221519

Chen, S., Ganum, P., Liu, L. Q., Martinez, L., & Martinez Peria, M. (2019). Debt maturity and the use of short-term debt. In *International Monetary Fund: Research Department* (Vol. 19, Issue 03). https://doi.org/10.5089/9781484380536.087

Chira, I., Adams, M., & Thornton, B. (2008). Behavioral bias within the decision making process. *Journal of Business & Economics Research (JBER)*, *6*(8), 11–20. https://doi.org/10.19030/jber.v6i8.2456

Costa, D. F., de Melo Carvalho, F., de Melo Moreira, B. C., & do Prado, J. W. (2017). Bibliometric analysis on the association between behavioral finance and decision making with cognitive biases such as overconfidence, anchoring effect and confirmation bias. *Scientometrics*, *111*(3), 1775–1799. https://doi.org/10.1007/s11192-017-2371-5

Doherty, M. E., & Tweney, R. D. (1983). Rationality and the psychology of inference. *Synthese*, *57*(2), 139–161. https://doi.org/10.1007/bf01063999

Eric, J., & Herrmann, A. (2010). Individual-level loss aversion in riskless and risky choices. In *Econstor*. https://www.econstor.eu/bitstream/10419/49656/1/640944027.pdf

Eurofound. (2020). *Low levels of optimism in Portugal as labour market challenges take hold*. https://www.mynewsdesk.com/eurofound/news/low-levels-of-optimism-in-portugal-as-labour-market-challenges-take-hold-404147

Evans, J. S. B. T., & Ball, L. J. (2010). Do people reason on the Wason selection task? A new

look at the data of Ball et al. (2003). *Quarterly Journal of Experimental Psychology*, *63*(3), 434–441. https://doi.org/10.1080/17470210903398147

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, *65*(3), 365–395. https://doi.org/10.1016/s0304-405x(02)00146-0

Fiddick, L., Cosmides, L., & Tooby, J. (2000). No interpretation without representation: the role of domain-specific representations and inferences in the Wason selection task. *Cognition*, *77*(1), 1–79. https://doi.org/10.1016/S0010-0277(00)00085-8

Filbeck, G., Ricciardi, V., Evensky, H. R., Fan, S. Z., Holzhauer, H. M., & Spieler, A. (2017). Behavioral finance: a panel discussion. *Journal of Behavioral and Experimental Finance*, *15*, 52–58. https://doi.org/10.1016/j.jbef.2017.07.008

Frank, M. Z., & Goyal, V. K. (2007). Corporate leverage: how much do managers really matter? *SSRN Electronic Journal*, 1–38. https://doi.org/10.2139/ssrn.971082

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? *Financial Management*, *38*(1), 1–37. https://doi.org/10.1111/j.1755-053x.2009.01026.x

Gilson, S. C. (1989). Management turnover and financial distress. *Journal of Financial Economics*, *25*(2), 241–262. https://doi.org/10.1016/0304-405X(89)90083-4

González, M., Guzmán, A., Pombo, C., & Trujillo, M. A. (2013). Family firms and debt: risk aversion versus risk of losing control. *Journal of Business Research*, *66*(11), 2308–2320. https://doi.org/10.1016/j.jbusres.2012.03.014

Graham, J. R., Harvey, C. R., & Puri, M. (2013). Managerial attitudes and corporate actions. *Journal of Financial Economics*, *109*(1), 103–121. https://doi.org/10.1016/j.jfineco.2013.01.010

Hackbarth, D. (2008). Managerial traits and capital structure decisions. *Journal of Financial and Quantitative Analysis*, *43*(4), 843–881. https://doi.org/10.1017/S002210900001437X

Hadjimichalis, C. (2021). An uncertain future for the post-Brexit, post-covid-19 European Union. *European Urban and Regional Studies*, *28*(1), 8–13. https://doi.org/10.1177/0969776420968961

Hardisty, D. J., Appelt, K. C., & Weber, E. U. (2013). Good or bad, we want it now: fixed-cost present bias for gains and losses explains magnitude asymmetries in intertemporal choice. *Journal of Behavioral Decision Making*, *26*(4), 348–361. https://doi.org/10.1002/bdm.1771

Hastings, J. S., & Mitchell, O. S. (2011). How financial literacy and impatience shape

retirement wealth and investment behaviors. In *NBER Working Paper Series*. https://doi.org/10.3386/w16740

Heaton, J. B. (2002). Managerial optimism and corporate finance. *Financial Management*, *31*(2), 33–45. https://doi.org/10.2307/3666221

Herzog, S. M., & Hertwig, R. (2009). The wisdom of many in one mind: improving individual judgments with dialectical bootstrapping. *Psychological Science*, *20*(2), 231–237. https://doi.org/10.1111/j.1467-9280.2009.02271.x

Herzog, S. M., & Hertwig, R. (2014). Think twice and then: combining or choosing in dialectical bootstrapping? *Journal of Experimental Psychology: Learning Memory and Cognition*, *40*(1), 218–232. https://doi.org/10.1037/a0034054

Hirt, E. R., & Markman, K. D. (1995). Multiple explanation: a consider-an-alternative strategy for debiasing judgments. *Journal of Personality and Social Psychology*, *69*(6), 1069–1086. https://doi.org/10.1037/0022-3514.69.6.1069

Hofstede, G. (1980). *Culture's consequences: international differences in work-related values*. Sage. https://books.google.pt/books?hl=pt-PT&lr=&id=Cayp_Um4O9gC&oi=fnd&pg=PA13&dq=Culture's+Consequences:+International+Differences+in+Work-Related+Values&ots=V5DyEERQM6&sig=smBzDEprY3QQ02J0-rpXgvvStjQ&redir_esc=y#v=onepage&q=Culture's Consequences%3A Internat

Hofstede, G. (1996). Riding the waves of commerce: a test of Trompenaars' "model" of national culture differences. *International Journal of Intercultural Relations*, *20*(2), 189–198. https://doi.org/10.1016/0147-1767(96)00003-X

Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions and organizations across nations*. Sage. https://books.google.pt/books?hl=pt-PT&lr=&id=9HE-DQAAQBAJ&oi=fnd&pg=PP1&dq=Culture's+Consequences:+Comparing+Values,+Behaviors,+Institutions+and+Organizations+Across+Nations&ots=lLv6rTy0NV&sig=hCBGg0IFl1vbQAOJ93VMM-EqLjU&redir_esc=y#v=onepage&q=Culture's

Hovakimian, A., Opler, T., & Sheridan, T. (2001). The debt-equity choice. *The Journal of Financial and Quantitative Analysis*, *36*(1), 1–24. https://doi.org/10.2307/2676195

Iacobucci, D., Posavac, S. S., Kardes, F. R., Schneider, M. J., & Popovich, D. L. (2015). The median split: robust, refined, and revived. *Journal of Consumer Psychology*, *25*(4), 690–704. https://doi.org/10.1016/j.jcps.2015.06.014

Jacobsen, B., Lee, J. B., Marquering, W., & Zhang, C. Y. (2014). Gender differences in

optimism and asset allocation. *Journal of Economic Behavior and Organization*, *107*(1), 630–651. https://doi.org/10.1016/j.jebo.2014.03.007

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405x(76)90026-x

Jones, M., & Sudgen, R. (2001). Positive confirmation bias in the acquisition of information. *Theory and Decision*, *50*(1), 59–99. https://link.springer.com/content/pdf/10.1023/A:1005296023424.pdf

Kahneman, D., Lovallo, D., & Sibony, O. (2011). Before you make that big decision. *Harvard Business Review*, 51–60. https://d1wqtxts1xzle7.cloudfront.net/53660272/Kahnemann-Before_you_make_that_big_decision.pdf?1498448493=&response-content-disposition=inline%3B+filename%3DThe_Big_Idea.pdf&Expires=1620080024&Signature=JnPlku8I5c23eI7JKgMOWowDVb8TVE-0pYMNdjAs0XhhKm1Eldrr

Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica*, *47*(2), 263–292. https://doi.org/10.2307/1914185

Kassin, S. M., Dror, I. E., & Kukucka, J. (2013). The forensic confirmation bias: problems, perspectives, and proposed solutions. *Journal of Applied Research in Memory and Cognition*, *2*(1), 42–52. https://doi.org/10.1016/j.jarmac.2013.01.001

Katchova, A. (2013). Instrumental variables. *Econometrics Academy*, 1–12. https://sites.google.com/site/econometricsacademy/home

Klayman, J., & Ha, Y. (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, *94*(2), 211–228. https://doi.org/10.1037/0033-295x.94.2.211

Kliger, D., & Levy, O. (2009). Theories of choice under risk: insights from financial markets. *Journal of Economic Behavior and Organization*, *71*(2), 330–346. https://doi.org/10.1016/j.jebo.2009.01.012

Köbberling, V., & Wakker, P. P. (2005). An index of loss aversion. *Journal of Economic Theory*, *122*(1), 119–131. https://doi.org/10.1016/j.jet.2004.03.009

Kozeniauskas, N., Moreira, P., & Santos, C. (2020). *Covid-19 and firms: productivity and government policies*. https://cepr.org/active/publications/discussion_papers/dp.php?dpno=15156#

Landier, A., & Thesmar, D. (2009). Financial contracting with optimistic entrepreneurs. *The Review of Financial Studies*, *22*(1), 117–150. https://doi.org/10.1093/rfs/hhn065

LeFebvre, R., & Franke, V. (2013). Culture matters: individualism vs. collectivism in conflict

decision-making. *Societies*, *3*(1), 128–146. https://doi.org/10.3390/soc3010128

Leys, C., Ley, C., Klein, O., Bernard, P., & Licata, L. (2013). Detecting outliers: do not use standard deviation around the mean, use absolute deviation around the median. *Journal of Experimental Social Psychology*, *49*(4), 764–766. https://doi.org/10.1016/j.jesp.2013.03.013

Loewenstein, G., Read, D., & Baumeister, R. F. (2003). *Time and decision: economic and psychological perspectives on intertemporal choice*. Russell Sage Foundation Press. https://books.google.pt/books?hl=pt-PT&lr=&id=tAOGAwAAQBAJ&oi=fnd&pg=PR5&dq=Loewenstein+time+and+decision&ots=vPBwYFIS1y&sig=usdOaJMNFAhT_smYNpXilC3ZeDo&redir_esc=y#v=onepage&q=Loewenstein time and decision&f=false

Lykes, V. A., & Kemmelmeier, M. (2014). What predicts loneliness? Cultural difference between individualistic and collectivistic societies in Europe. *Journal of Cross-Cultural Psychology*, *45*(3), 468–490. https://doi.org/10.1177/0022022113509881

March, J. G., & Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science*, *33*(11), 1404–1418. https://doi.org/10.1287/mnsc.33.11.1404

Mcgraw, A. P., Mellers, B. A., & Ritov, I. (2004). The affective costs of overconfidence. *Journal of Behavioral Decision Making*, *17*(4), 281–295. https://doi.org/10.1002/bdm.472

Milidonis, A., & Stathopoulos, K. (2014). Managerial incentives, risk aversion, and debt. *Journal of Financial and Quantitative Analysis*, *49*(2), 453–481. https://doi.org/10.1017/s0022109014000301

Miller, E. M. (1977). Risk, uncertainty, and divergence of opinion. *The Journal of Finance*, *32*(4), 1151–1168. https://doi.org/10.1111/j.1540-6261.1977.tb03317.x

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, *48*(3), 261–297. https://doi.org/10.1257/aer.103.7.i

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, *39*(3), 575–592. https://doi.org/10.2307/2327916

Myers, S. C. (2001). Capital structure. *Journal of Economic Perspectives*, *15*(2), 81–102. https://doi.org/10.1257/jep.15.2.81

Nickerson, R. S. (1998). Confirmation bias: a ubiquitous phenomenon in many guises. *Review of General Psychology*, *2*(2), 175–220. https://doi.org/10.1037/1089-2680.2.2.175

Puri, M., & Robinson, D. T. (2007). Optimism and economic choice. *Journal of Financial Economics*, *86*(1), 71–99. https://doi.org/10.1016/j.jfineco.2006.09.003

PWC Portugal. (2019). *23º CEO survey: navegando os crescentes fatores de incerteza*. https://www.pwc.pt/pt/temas-actuais/ceosurvey.html#explore

Romano, C. A., Tanewski, G. A., & Smyrnios, K. X. (2001). Capital structure decision making: a model for family business. *Journal of Business Venturing*, *16*(3), 285–310. https://doi.org/10.1016/S0883-9026(99)00053-1

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063–1078. https://doi.org/10.1037/0022-3514.67.6.1063

Segerstrom, S. C., Evans, D. R., & Eisenlohr-Moul, T. A. (2011). Optimism and pessimism dimensions in the Life Orientation Test-Revised: method and meaning. *Journal of Research in Personality*, *45*(1), 126–129. https://doi.org/10.1016/j.jrp.2010.11.007

Shefrin, H. (2001). Behavioral corporate finance. *Journal of Applied Corporate Finance*, *14*(3), 113–126. https://doi.org/10.1111/j.1745-6622.2001.tb00443.x

Shefrin, H. (2008). *A behavioral approach to asset pricing*. Academic Press Advanced Finance. https://doi.org/10.1016/b978-0-12-374356-5.x5001-3

Smith, C. W., & Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*, *32*(3), 263–292. https://doi.org/10.1016/0304-405X(92)90029-W

Ting, I. W. K., Lean, H. H., Kweh, Q. L., & Azizan, N. A. (2016). Managerial overconfidence, government intervention and corporate financing decision. *International Journal of Managerial Finance*, *12*(1), 4–24. https://doi.org/10.1108/IJMF-04-2014-0041

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, *43*(1), 1–19. https://doi.org/10.1111/j.1540-6261.1988.tb02585.x

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *The Journal of Business*, *59*(4), S251–S278. https://doi.org/10.1086/296365

Tversky, A., & Kahneman, D. (1992). Advances in prospoect theory: cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297–323. https://doi.org/10.1007/bf00122574

Wason, P. C. (1968). Reasoning about a rule. *The Quarterly Journal of Experimental Psychology*, *20*(3), 273–281. https://doi.org/10.1080/14640746808400161

Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, *39*(5), 806–820. https://doi.org/10.1037/0022-3514.39.5.806

Wu, C., & Yu, C. H. (1996). Risk aversion and the yield of corporate debt. *Journal of Banking*

and Finance, *20*(2), 267–281. https://doi.org/10.1016/0378-4266(94)00099-9

Yates, J. F., & de Oliveira, S. (2016). Culture and decision making. *Organizational Behavior and Human Decision Processes*, *136*, 106–118. https://doi.org/10.1016/j.obhdp.2016.05.003

8. Appendix

Appendix A | Full Survey (Portuguese)

Caro participante,

O meu nome é Mafalda Amorim Teixeira e estou a desenvolver a minha tese no campo de Behavioral Finance.

Este questionário tem o propósito de estudar a relação entre o comportamento cognitivo de um executivo e decisões de estrutura de capital da sua empresa. Todos os dados são recolhidos de forma anónima e usados exclusivamente para esta pesquisa.

Levará cerca de 10 minutos a concluir o questionário, sendo que a sua participação é uma contribuição extremamente valiosa para a minha investigação. Peço-lhe que responda da maneira mais honesta possível.

Em caso de dúvidas sobre o estudo, não hesite em contactar-me através do email: mafalda.amorim.teixeira@gmail.com

Se tiver interesse em receber os resultados da minha análise basta enviar um e-mail para mim com esse pedido. Terei todo o gosto em partilhá-los consigo.

Obrigada pela sua colaboração!

Part 1: Demographics

Posição atual na empresa (ex: *CEO*, *CFO*)

_____

Há quanto tempo trabalha na sua posição atual (Número de anos)

_____

Número total de anos de experiência profissional

_____

Idade

_____

Género

- ○ Feminino
- ○ Masculino

- ○ _____

Grau de Escolaridade

- ○ Ensino Secundário
- ○ Ensino Superior – Licenciatura
- ○ Ensino Superior – Mestrado
- ○ Ensino Superior – Pós-Graduação ou formação especializada
- ○ Ensino Superior – MBA
- ○ Outro: _____

Estudou no estrangeiro?

- ○ Sim
- ○ Não

Área de Formação

- ○ Gestão
- ○ Economia
- ○ Finanças
- ○ Contabilidade
- ○ Marketing/Vendas
- ○ Outra: _____

Part 2: Behavioral Biases

Por favor responda às seguintes afirmações sobre si mesmo indicando a que nível concorda ou discorda das mesmas.

	Discordo Fortemente	Discordo	Neutro	Concordo	Concordo Fortemente
Em tempos de incerteza, costumo esperar pelo melhor.	○	○	○	○	○
É fácil para mim relaxar.	○	○	○	○	○
Se algo me puder correr mal, vai correr.	○	○	○	○	○
Sou sempre otimista em relação ao meu futuro.	○	○	○	○	○
Aprecio muito os meus amigos.	○	○	○	○	○
É importante para mim manter-me ocupado.	○	○	○	○	○
Quase nunca espero que algo aconteça a meu favor.	○	○	○	○	○
Não fico facilmente chateado.	○	○	○	○	○
Raramente conto que coisas boas me aconteçam.	○	○	○	○	○
Em geral, espero que me aconteçam mais coisas boas que más.	○	○	○	○	○

Assuma que é a única fonte de rendimento do seu agregado familiar e que foi aconselhado a mudar-se para outra zona do país pelo seu médico, devido a um problema respiratório. Tem duas oportunidades de trabalho por onde escolher (selecione a opção que prefere):

- ○ Um trabalho com 100% probabilidade de pagar o mesmo que recebe atualmente para sempre;
- ○ Um trabalho com 50% probabilidade de pagar o dobro do que recebe atualmente para sempre e 50% probabilidade de pagar 2/3 do que recebe atualmente para sempre;

If the respondent picks the first option, the survey asks:
O que escolheria se as opções na verdade fossem as seguintes (selecione uma):

- ○ Um trabalho com 100% probabilidade de pagar o mesmo que recebe atualmente para sempre;
- ○ Um trabalho com 50% probabilidade de pagar o dobro do que recebe atualmente para sempre e 50% probabilidade de pagar 4/5 do que recebe atualmente para sempre;

If the respondent picks the second option, the survey asks:
O que escolheria se as opções na verdade fossem as seguintes (selecione uma):

- ○ Um trabalho com 100% probabilidade de pagar o mesmo que recebe atualmente para sempre;
- ○ Um trabalho com 50% probabilidade de pagar o dobro do que recebe atualmente para sempre e 50% probabilidade de pagar 1/2 do que recebe atualmente para sempre;

Abaixo encontra-se um conjunto de seis lotarias onde se atira uma moeda ao ar e há 50% probabilidade de ganhar e 50% probabilidade de perder. Para cada uma delas escolha se aceitaria ou rejeitaria jogar.

	Aceitar	Rejeitar
Se sair coroa, perde 2€; se sair cara, ganha 6€.	○	○
Se sair coroa, perde 3€; se sair cara, ganha 6€.	○	○

Se sair coroa, perde 4€; se sair cara, ganha 6€.	○	○
Se sair coroa, perde 5€; se sair cara, ganha 6€.	○	○
Se sair coroa, perde 6€; se sair cara, ganha 6€.	○	○
Se sair coroa, perde 7€; se sair cara, ganha 6€.	○	○

No ano passado a sua empresa investiu €2.5 milhões num projeto com retorno esperado de €5 milhões após um ano. Contudo, um ano passou e o projeto não gerou rendimento.
Tem agora a oportunidade de investir mais dinheiro neste projeto. Há 20% probabilidade de o projeto gerar €5 milhões em fluxo de caixa no próximo ano e nada mais após isso. Há 80% probabilidade do novo investimento não gerar nada. Quanto estaria disposto a investir hoje? (Em milhões de euros)

_____

Para as próximas duas perguntas vão estar disponíveis quatro cartas que mostram números ou letras. Cada carta tem uma letra de um lado e um número do outro.

1. *Se uma carta tem uma vogal de um lado, então a carta tem um número par do outro.*

Que cartas tem de virar para confirmar se esta regra é verdadeira? Selecione no máximo duas.

A	B	4	7

2. *Se uma carta tem um número acima de 10 de um lado, então a carta tem uma consoante do outro.*

Que cartas tem de virar para confirmar se esta regra é verdadeira? Selecione no máximo duas.

15	H	U	9

Preferia ganhar 5 000€ hoje ou 6 500€ daqui a um ano?

○ 5 000€ hoje

○ 6 500€ daqui a um ano

○ Não tenho preferência

Preferia perder 5,000€ hoje ou 6,500€ daqui a um ano?

- ○ 5 000€ hoje
- ○ 6 500€ daqui a um ano
- ○ Não tenho preferência

Part 3: Company Characteristics

Seguem-se algumas questões relativas à sua empresa.

Setor de Atividade

- ○ Agricultura, produção animal, caça, silvicultura e pesca
- ○ Indústrias Extrativas
- ○ Indústrias Transformadoras
- ○ Eletricidade, gás e água
- ○ Construção
- ○ Comércio por grosso e retalho
- ○ Transporte e armazenagem
- ○ Alojamento, restauração e similares
- ○ Atividades Financeiras e de seguros
- ○ Atividades Imobiliárias
- ○ Educação
- ○ Atividades de saúde humana e apoio social
- ○ Outro: _____

A sua empresa é cotada?

- ○ Sim

○ Não

A sua empresa é um negócio familiar (tem membros da família no conselho administrativo)?

○ Sim

○ Não

Volume de negócios anual (em €)

_____

Valor do Ativo Total (em €)

_____

Debt Ratio: Rácio de Endividamento - Passivo Total /Ativo Total (em %)

_____

Debt-to-Equity Ratio: Passivo Total / Capital Próprio (em %)

_____

Short-term Debt Ratio: Rácio de Endividamento de Curto-Prazo - Passivo Corrente/Passivo Total (em %)

_____

Historical Growth: Crescimento Anual de Vendas (Receitas) dos últimos 3 anos (em %)

_____

Return on Assets - ROA: Lucro Líquido/Ativo Total (em %)

_____

Part 4: Investment Decisions

Como classificaria o nível de envolvimento que tem em decisões de estrutura de capital?

	0 10 20 30 40 50 60 70 80 90 100
Nível de Envolvimento	○

Na empresa, somos mais prováveis de emitir divida de longo prazo (com maior maturidade) quando as taxas de juro estão particularmente baixas.

Discordo Totalmente	Discordo	Neutro	Concordo	Concordo Totalmente
○	○	○	○	○

Quão forte é a preferência da sua empresa em financiar investimentos com fundos internos ou externos?

Grande Preferência por fundos internos	2	Mesma Preferência	4	Grande Preferência por fundos externos
○	○	○	○	○

Assumindo que a sua empresa precisa de financiamento externo, prefere contrair dívida ou emitir títulos de capital próprio?

Grande Preferência por contrair dívida	2	Mesma Preferência	4	Grande Preferência por emitir títulos de capital próprio
○	○	○	○	○

Appendix B | Variables Overview

Variables	Description
	Dependent Variables
Debt Ratio (%)	$\frac{Total\ Debt}{Total\ Assets}$
Short-term Debt Ratio (%)	$\frac{Short-term\ Debt}{Total\ Debt}$
	Independent Variables
Optimism	Dummy Variable (1 if optimistic; 0 if otherwise)
Risk Aversion	Dummy Variable (1 if risk-averse; 0 if otherwise)
Loss Aversion	Dummy Variable (1 if loss-averse; 0 if otherwise)
Confirmation Bias	Dummy Variable (1 if confirmation biased; 0 if otherwise)
Present Bias	Dummy Variable (1 if present biased; 0 if otherwise)
	Control Variables
	Demographic/career Characteristics
Gender	Dummy Variable (1 if male; 0 if female)
Years of Experience	Total years a person has been working (continuous variable)
Education Level	Dummy Variable (1 if higher than bachelor; 0 if otherwise)
Degree Choice	Dummy Variable (1 if Business/Economics; 0 if otherwise)
Studied Abroad	Dummy Variable (1 if yes; 0 if no)
	Firm-specific Characteristics
Size	Dummy Variable (1 if firm is large - Sales revenue >€50M; 0 if otherwise)
Public	Dummy Variable (1 if firm is public; 0 of otherwise)
Family-Owned	Dummy Variable (1 if firm is family-owned; 0 of otherwise)
ROA (%)	$\frac{Operating\ Income}{Total\ Assets}$
	Industry-level Characteristics
Industry Fixed Effects	Industry Dummies

Note. This table describes all variables used in the main analysis of this dissertation. The detailed explanation on how an executive is considered optimistic, risk-averse, loss-averse, present biased, or confirmation biased is in Section 3.3.2.

Appendix C | Summary Statistics

Table C1

Firm characteristics summary statistics

	Observations	Mean	Std. Dev.	Minimum	Maximum
Panel A: All Firms					
Public	8	9.5%	-	-	-
Family-Owned	49	58.3%	-	-	-
Sales Volume (M€)	84	529.3	2298.6	0.5	20000.0
Historical Growth (%)	84	18.0	54.6	-85.0	400.0
ROA (%)	84	16.7	55.8	-10.0	500.0
Debt Ratio (%)	84	32.0	27.8	0.0	98.0
Debt-to-Equity Ratio (%)	84	116.3	423.2	0.0	3800.0
Short-term Debt Ratio (%)	84	33.8	35.8	0.0	100.0
Panel B: Public Firms only					
Sales Volume (M€)	8	1689.0	1715.7	183.0	5200.0
Historical Growth (%)	8	3.2	4.5	-4.3	10.0
ROA (%)	8	3.6	4.1	0.0	12.0
Debt Ratio (%)	8	28.2	27.8	0.0	70.0
Debt-to-Equity Ratio (%)	8	77.3	100.5	0.0	230.0
Short-term Debt Ratio (%)	8	13.4	15.1	0.0	37.0
Panel C: Family-Owned Firms only					
Sales Volume (M€)	49	671.7	2919.0	0.9	20000.0
Historical Growth (%)	49	14.8	44.3	-85.0	220.0
ROA (%)	49	8.8	10.5	0.0	65.0
Debt Ratio (%)	49	34.1	27.7	0.0	85.0
Debt-to-Equity Ratio (%)	49	82.3	127.8	0.0	557.0
Short-term Debt Ratio (%)	49	36.5	35.0	0.0	100.0

Table C2

Firms' investment decisions

	All Firms			Public Firms			Family-Owned Firms		
	Observations	Mean	Median	Observations	Mean	Median	Observations	Mean	Median
(1)	84	2.65	2.50	8	3.63	4.00	49	2.82	2.00
(2)	84	2.13	2.00	8	2.25	2.00	49	1.73	1.00

Note. This table reports a summary of the answers given by executives in the survey regarding firms' investment decisions. (1) Does you firm prefer to fund investments with internal or external funds? (Scoring: 1-Big Preference for Internal Funds; 3-Same Preference; 5-Big Preference for External Funds); (2) Assuming your firm needs external funding, does it prefer to use debt-like or equity-like securities? (Scoring: 1-Strong Preference for Debt; 3-Same Preference; 5-Strong Preference for Equity);

Table C3

Personal characteristics of corporate executives

	Observations	Mean	Std. Dev	Min	Max
Categorical Variables					
Role					
CEOs	57	67.9%	-	-	-
Other Roles	27	32.1%	-	-	-
Gender					
Male	71	84.5%	-	-	-
Female	13	15.5%	-	-	-
Level of Education					
High School	5	6.0%	-	-	-
Bachelor	25	29.8%	-	-	-
Masters	20	23.8%	-	-	-
Post Grad. or Specialized Education	10	11.9%	-	-	-
MBA	24	28.6%	-	-	-
Degree Choice					
Economics	17	20.2%	-	-	-
Business	38	45.2%	-	-	-
Other	29	34.5%	-	-	-
Studied Abroad	38	45.2%	-	-	-
Continuous Variables					
Age	84	56.8	9.9	30.0	76.0
Years of Experience	84	33.7	9.9	7.0	55.0
Tenure in Current Position	84	16.5	10.8	1.0	43.0

Appendix D | Tables of Analysis

Table D1

Executives division according to their role at their firm

Role	Observations	Percentage
CEOs	57	67.9
CFOs	9	10.7
Chairman	6	7.1
General Director	1	1.2
Executive Board	10	11.9
Non-Executive Board	1	1.2

Note. The roles are translated in English (in the questionnaire they were in Portuguese).

Table D2

Correlation table

Variables	(Optimism)	(Risk Aversion)	(Loss Aversion)	(Confirmation Bias)	(Present Bias)	(Gender)	(Age)	(Years of Experience)	(Tenure in Current Position)
Optimism	1								
Risk Aversion	-0.117	1							
Loss Aversion	-0.130	0.0924	1						
Confirmation Bias	0.069	-0.0275	-0.0217	1					
Present Bias	-0.134	-0.0187	0.157	-0.0142	1.000				
Gender	-0.0285	-0.154	0.0354	-0.171	0.132	1			
Age	-0.134	-0.0613	-0.043	-0.0399	-0.0862	0.189	1		
Years of Experience	-0.109	-0.115	-0.0827	-0.0595	-0.0586	0.199	0.942***	1	
Tenure in Current Position	-0.185	-0.2	0.316**	-0.0497	0.0852	-0.0241	0.291**	0.401***	1
Education Level	0.043	-0.131	0.0336	0.258*	-0.183	-0.113	-0.117	-0.148	-0.114
Degree Choice	-0.0289	0.0924	-0.0533	0.181	0.106	-0.103	-0.155	-0.209	-0.0885
Studied Abroad	0.0345	-0.0695	0.00599	0.11	0.0258	-0.00787	-0.157	-0.182	-0.295**
Size	-0.118	-0.117	-0.0795	-0.0764	-0.283**	0.105	0.15	0.179	0.0163
Public	0.129	-0.0889	-0.106	0.0351	-0.255*	0.139	-0.0594	-0.0448	-0.163
Family-Owned	-0.244*	0.0443	0.148	0.0000	0.0663	-0.161	0.0367	0.0705	0.202
Historical Growth	0.075	-0.0541	-0.191	0.0188	0.0343	-0.0494	-0.218*	-0.185	-0.123
ROA	0.121	0.0794	-0.122	-0.121	-0.0264	0.0825	-0.184	-0.185	-0.166

Note. This table reports the correlations between firm and executive characteristics for the sample of Portuguese executives. Age is a dummy variable, 1 if executives are older than the median of the sample, 0 if otherwise. Tenure in current position and historical growth are continuous variables. The remaining variables are defined as in Appendix B.
* p<0.05, ** p<0.01, *** p<0.001

Table D2

Correlation table – continued

Variables	(Education Level)	(Degree Choice)	(Studied Abroad)	(Size)	(Public)	(Family-Owned)	(Historical Growth)	(ROA)
Optimism								
Risk Aversion								
Loss Aversion								
Confirmation Bias								
Present Bias								
Gender								
Age								
Years of Experience								
Tenure in Current Position								
Education Level	1							
Degree Choice	-0.0187	1						
Studied Abroad	0.278*	0.107	1					
Size	-0.0574	-0.13	0.131	1				
Public	0.0725	-0.106	0.113	0.375***	1			
Family-Owned	-0.0756	-0.207	0.0566	0.195	-0.0548	1		
Historical Growth	-0.00976	-0.155	0.0336	-0.224*	-0.0882	-0.0682	1	
ROA	-0.113	-0.106	0.102	-0.145	-0.0765	-0.168	0.805***	1

Note. This table reports the correlations between firm and executive characteristics for the sample of Portuguese executives. Age is a dummy variable, 1 if executives are older than the median sample, 0 if otherwise. Tenure in current position and historical growth are continuous variables. The remaining variables are defined as in Appendix B.
* p<0.05, ** p<0.01, *** p<0.001

Table D3

Regression analysis of behavioral biases on the debt ratio (full table)

Dependent Variable: Debt Ratio			
	OLS		
	(1)	(2)	(3)
Optimism	0.050	0.109*	0.105
	(0.066)	(0.062)	(0.075)
Risk Aversion	-0.105*	-0.112*	-0.085
	(0.061)	(0.061)	(0.073)
Loss Aversion	0.109*	0.134**	0.137**
	(0.065)	(0.063)	(0.065)
Confirmation Bias	-0.022	-0.018	-0.019
	(0.062)	(0.065)	(0.069)
Present Bias	-0.03	0.003	-0.027
	(0.064)	(0.069)	(0.080)
Gender		-0.104	-0.145**
		(0.076)	(0.072)
Years of Experience		0.005	0.005
		(0.003)	(0.004)
Education Level		-0.053	-0.038
		(0.076)	(0.084)
Degree Choice		0.130**	0.175**
		(0.065)	(0.071)
Studied Abroad		-0.130**	-0.204**
		(0.060)	(0.081)
Size		0.166**	0.192**
		(0.073)	(0.089)
Public		-0.088	-0.072
		(0.108)	(0.122)
Family-Owned		0.017	-0.019
		(0.067)	(0.080)
ROA		-0.03	-0.034
		(0.033)	(0.036)
Constant	0.305***	0.125	0.090
	(0.090)	(0.227)	(0.247)
Industry Dummies	No	No	Yes
Observations	84	84	84
R-squared	0.074	0.302	0.445

Note. All variables are defined as in Appendix B. Industry Classifications are expressed in Appendix D, Table D5.
Note 2. (1) Regression without controls; (2) Regression with controls before industry dummies; (3) Regression with controls and industry dummies.
[a]Robust standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table D4

Regression analysis of behavioral biases on the short-term debt ratio (full table)

Dependent Variable: Short-term Debt Ratio			
	OLS		
	(1)	(2)	(3)
Optimism	-0.113	-0.042	0.016
	(0.079)	(0.077)	(0.093)
Risk Aversion	0.008	-0.007	0.007
	(0.081)	(0.082)	(0.102)
Loss Aversion	-0.068	-0.053	-0.056
	(0.085)	(0.081)	(0.078)
Confirmation Bias	-0.05	-0.073	-0.085
	(0.081)	(0.083)	(0.081)
Present Bias	-0.02	0.024	0.074
	(0.080)	(0.092)	(0.108)
Gender		-0.206*	-0.195*
		(0.106)	(0.109)
Years of Experience		0.003	0.004
		(0.004)	(0.005)
Education Level		0.018	0.065
		(0.098)	(0.105)
Degree Choice		0.148*	0.092
		(0.086)	(0.093)
Studied Abroad		-0.196***	-0.133
		(0.073)	(0.090)
Size		0.212**	0.140
		(0.089)	(0.103)
Public		-0.259**	-0.295**
		(0.113)	(0.119)
Family-Owned		-0.012	-0.133
		(0.090)	(0.102)
ROA		-0.074	-0.099*
		(0.049)	(0.057)
Constant	0.463***	0.436	0.233
	(0.106)	(0.316)	(0.391)
Industry Dummies	No	No	Yes
Observations	84	84	84
R-squared	0.036	0.276	0.429

Note. All variables are defined as in Appendix B. Industry Classifications are expressed in Appendix D, Table D5.
Note 2. (1) Regression without controls; (2) Regression with controls before industry dummies; (3) Regression with controls and industry dummies.
[a]Robust standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table D5

Industry categorization

Industry	Observations	Percentage
Agriculture, farming of animals, hunting and forestry	2	2.4
Mining and Quarrying	1	1.2
Manufacturing	15	17.9
Electricity, gas and water	2	2.4
Construction	3	3.6
Retail and Wholesale	10	11.9
Transportation and Storage	1	1.2
Accommodation and food service activities	4	4.8
Financial Activities and Insurance	11	13.1
Real Estate Activities	11	13.1
Education	1	1.2
Human Health and Social Work Activities	2	2.4
Other	21	25.0

Note. Industries are translated in English (in the questionnaire they were in Portuguese).
Note 2. Industry effects were controlled for in the analysis (as Industry Dummies).